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No. 1

## THE COMING SEASON OF LAKE NAVIGATION.

All matters pertaining to the transportation of iron ore, the principal item of freight on the great lakes, are now so largely under the control of the United States Steel Corporation, that even the annual meeting of the Lake Carriers' Association, which occurs about the middle of January, is exciting far less interest than in previous years, and the so-called independent shippers of ore will do nothing regarding lake freight contracts for another year until a move has been made by representatives of the big organization. It is the general opinion of the shippers that, in view of the effort in all branches of the steel industry to continue the present basis of prices, the steel corporation will try to establish for 1902 the 80-cent contract lake freight rate of the past year, but nothing has been done to confirm that belief, and the vessel owners are hoping for a better rate, especially on account of the losses they sustained through unusual delays at ore docks during 1901. They certainly have no reason for worry on the score of a lower rate if the condition of the steel and iron industry is to have the usual bearing upon the lake situation. No new year in the history of the iron trade has been ushered in more favorably. The main effort on the part of the leading interests is to prevent further advances in prices of material and thus avoid disastrous results always feared from a boom. One class of vessels, those of the smaller type (up to 2,500 or 3,000 tons), will certainly have the call this year from all shippers as soon as the contract rate on ore is fixed.

As regards the coming Lake Carriers' meeting, it is more than probable that the support of the steel corporation will be with the association, mainly on account of its influence from a congressional point of view, which involves river and harbor improvements and other legislative matters. Dates fixed for the meeting, which is to be held as usual at the Hotel Cadillac in Detroit, are Jan. 14, 15 and 16. Mr. A. B. Wolvin, president of the association, will undoubtedly retire in accordance with the custom of having the president serve but one term. Some other changes of importance, which can not as yet be announced, will also be made in the officers, but there is nothing definite regarding the presidency for another year. Members of the association best acquainted with its workings desire a Cleveland owner for president. The work of the executive committee is conducted mainly from Cleveland, and it is necessary that the president should be all the time in touch with affairs of that committee.

## ONE ITEM OF DECREASE IN LAKE COMMERCE

Although big gains have been generally reported in the movement of freight over the great lakes during the season of navigation just closed, there is one important branch of the traffic in which a marked decrease is recorded. Failure of the crops in corn and oats caused a difference, compared with 1900, of about 49,000,000 bushels in the total grain movement eastward by water from Chicago. The aggregate shipments of grain of all kinds out of Chicago from the best figures available was 130,818,292 bushels in 1900, compared with 81,658,681 bushels in the season just closed. The statement of the Chicago Board of Trade on this score is as follows:

	1901, bushels.	1900, bushels.
Wheat .....	31,523,724	26,577,243
Corn .....	33,833,732	78,967,900
Oats .....	15,178,727	24,375,835
Rye .....	399,861	455,000
Barley .....	185,088	452,176
Total .....	81,658,681	130,818,292

It will be noted that there is in round numbers a decrease of 45,000,000 bushels in corn and 9,000,000 bushels in oats, while wheat shows a gain of 5,000,000 bushels.

## FOR ERIE CANAL IMPROVEMENT.

There is some interesting news from Buffalo in Gov. Odell's message to the incoming legislature. The governor will recommend extensive improvements to the Erie canal and the establishment of a toll system out of which a sinking fund may be created that in twenty years will pay the entire cost of the improvements. It is said that the governor will recommend the expenditure of something like \$27,000,000 for the building of a 1,000-ton barge canal, for which the canal advocates in Buffalo have so long and sturdily fought. The governor does not propose that the \$27,000,000 shall be at once appropriated or raised by bond issue. He will suggest that by the expenditure of \$13,000,000 the present locks in the canal may be so lengthened that 1,000-ton barges of a draught of 6½ ft. may pass. Subsequently, he suggests an expenditure of \$14,000,000 to deepen the canal so that 1,000-ton barges, drawing 7½ ft. of water, may navigate it. This is according to the 1895 plan. The governor will propose that these sums shall be raised by bond issue and that a toll of 15 cents per ton shall be collected; that these tolls shall be made to establish a sinking fund and it is his belief that the tollage will in twenty years serve to pay the cost of the proposed improvements. It is understood, too, that the governor will in his message deal rigorously with the discrimination against the canal boatmen and in favor of the railroads by the Buffalo elevators. It is believed that he will recommend drastic legislation to correct these abuses.

The next issue of the Review, Thursday, Jan. 9, will be an elaborate special edition devoted to ship building throughout the United States. An illuminated cover, together with special articles and numerous elegant half-tone engravings will be features of this issue, which will very probably be the finest marine publication ever issued in this country. The price of single copies of this edition will be 25 cents.

## LAUNCH OF THE MISSOURI—SPEECH OF SECRETARY LONG.

The United States battleship Missouri was launched at the yards of the Newport News Co., Newport News, Va., last Saturday. Miss Marion Cockrell, daughter of the Missouri senator, performed the ceremony of breaking a bottle of champagne at the ship's bow and giving her her name. The feature of the launch was the address of Hon. John D. Long, secretary of the navy. He said:

"I have been interested in the circular signed by many eminent citizens, my beloved friend E. E. Hale at the head, in which they regret the estimate of \$100,000,000 for the increase of the navy. It is rather a taking thing to say that \$100,000,000 could be better spent for education or charity. And yet, on the other hand, \$100,000,000 spent in the employment of labor is the very best use to which it can be put. There is no charity in the interest of the popular welfare or of education so valuable as the employment of labor. To state extremes, a community supported by charity alone would be deplorable, while a community where every individual is supported by his own labor is almost the height of human felicity. If \$100,000,000 shall be appropriated for the navy by the present congress, a small part will go for the purchase of raw material, and something for salaries, but the great bulk of it for labor in every part of the union. In other words, it will not, as might perhaps be the first impression made by the above circular, be dumped into the sea. It will pay for bread and butter, for the better conditions of life, for the purchase of books, and for the support of persons and schoolmasters and the signers of this circular. I suspect a rich man does more good by spending his income in what would be gross extravagance on the part of anybody else—such as building houses and stables, laying out grounds, reviving old farms, buying and keeping horses and cattle, and in all the other expenditures which keep so many employees busy and so distribute his wealth—than if he hoarded it in a giant stocking or in the vaults of a bank.

"Nor is it true, as suggested in the circular, that a great navy necessarily inflames the fighting spirit and leads to war. If my recollection serves me right, while Great Britain has had troubles in Egypt and Africa and elsewhere, she has had no conflict on the sea for many years, and yet her navy has been twice as large as that of any other power. The recent increase in our navy did not induce the war with Spain, which, as things were, seems to have been inevitable. On the other hand it is more than likely that if in the beginning of 1896 we had had even as large a navy as we have now, certainly as large a one as now proposed, there would have been no war with Spain, and that country would have come to terms, as she was very near coming, without battle. At that time, however, it was the general impression among foreign powers, and probably in Spain, that her navy would blow us out of the water.

"All the foregoing deals with questions of expediency, which are the only questions raised in the circular. But there is a question of principle, and that question, strangely enough, the circular does not touch. Our world relations have expanded vastly more in international extent. It has not been an extension upon the continent, but upon the ocean itself and the islands of the sea in both hemispheres. Our commerce has greatly increased in value and area, and our American marine is likely to follow suit. If there is to be a navy at all it should be commensurate with all these extended relations and demands. I will not pursue the topic further, but a United States naval vessel carrying our flag into the ports and harbors of the world is something more than a fighting machine. It means relations with those ports; it means an awakening and lively respect there for our country; it means recognition of the outreach of our civilization, commerce and influence; it means just what would be meant if a fine representative of New York or Boston, carrying her prestige, exploiting her interests, were in every other city of the union."

President Orcutt of the ship yard introduced Secretary Hitchcock, who toasted the president of the United States. He brought sincere regrets from the president at his inability to be present. Senator Cockrell was then introduced. His subject was the "Commonwealth of Missouri." He dwelt upon the historical, geographical and military glory of his state. His was a humorous effort and was vigorously applauded. Gov. Tyler of Virginia followed the senator. Lieut.-Gov. Lee of Missouri paid a grateful tribute to Miss Cockrell.

The Missouri is a sister ship of the Ohio, building at San Francisco, and of the Maine, recently launched at Philadelphia. Her contract price was \$2,885,000. Her keel was laid on Feb. 7, 1900, and she is about half completed. Her contract speed is 18 knots an hour. A new feature introduced into the offensive power of this ship are two submerged torpedo tubes. While German warships have been equipped with these tubes for a number of years, the Missouri and her class are the first battleships of our navy to be supplied with them. The Missouri and her class are the first battleships of the United States navy having water-tube boilers.

Capt. A. B. Wolvin of Duluth, who some time ago sought certain rights for elevators, warehouses, etc., from the harbor commissioners of Montreal, but was not successful in arriving at an agreement, is now conducting similar negotiations with the harbor commissioners of Quebec. He was in conference a few days ago with the officials of that port, and the directors of one of the Canadian railways, the Great Northern. Capt. Wolvin is quoted as saying that interests which he represents will begin at once the construction of ten steel steamers for St. Lawrence river trade if sufficient inducements in terminal facilities are offered at Quebec.

Mr. Arthur F. Luke has resigned the position of treasurer of the United States Steel Corporation and Mr. Richard Trimble has been appointed in his place. Mr. Trimble was the secretary of the steel corporation. Mr. Luke enters a new partnership, Darr, Luke & Moore, who will conduct in New York a general investment and stock exchange commission business. The firm formerly was Darr & Moore.



## SHIP BUILDING IN MAINE.

## REVIEW OF WHAT HAS OCCURRED IN THE PRINCIPAL NEW ENGLAND DISTRICT DURING TEN MONTHS OF 1901—A DECIDED REVIVAL.

As has been noted repeatedly in the Review the ship building industry has undergone a great revival in Maine, especially as to wooden vessels. There have been launched and built in the Maine district this year vessels of 53,026 tons, costing \$3,393,700. There are under contract or construction today a gross tonnage of 178,422, valued at \$21,376,650. The greater part of this sum, however, is represented in naval contracts. New England has always possessed the skilled mechanics but their genius and ingenuity has been turned by circumstances during four decades mostly to other lines of industry. Now she has numerous ship building plants equipped with the latest machinery. Following is the summary of work at the various yards:

The Fore River Ship & Engine Co. has just completed its first year at Quincy and the showing made is most satisfactory. A greater part of the year has been spent in equipping the plant and in a few weeks, when the necessary steel arrives, the company expects to increase its force of men to a very large extent. During the past year the torpedo boat destroyers Lawrence and Macdonough have been completed for the United States government, and they are now ready for their speed trials. These boats have a tonnage of 400 each, and the contract price for each was \$281,000. The cruiser Des Moines is rapidly nearing completion, and will be launched in January. Her tonnage is 3,200 and the cost will be \$1,065,000. Within a few weeks the first-class battleships Rhode Island and New Jersey will be begun. These vessels will be of 16,600 tonnage and the contract price for each will be \$3,405,000. The keel of a seven-masted schooner has been laid. She will be of 11,600 tons and will cost \$250,000. The total tonnage built and contracted for during the year is 48,800 at contract prices amounting to \$8,767,000.

## THE BATH DISTRICT.

The table of construction in Bath from Jan. 1 to Nov. 1, 1901, is as follows:

Rig and builder.	Tonnage.
Barge, Kelley, Spear & Co. ....	1,617
Schooner, Percy & Small .....	2,374
Schooner, New England Co. ....	1,263
Schooner, James W. Hawley .....	1,191
Steamer, William T. Donnell .....	153
Schooner, Kelley, Spear & Co. ....	620
Schooner, Gardiner G. Deering .....	1,247
Barge, Kelley, Spear & Co. ....	497
Tug, Bath Iron Works .....	650
Barge, Kelley, Spear & Co. ....	1,617
Schooner, Percy & Small .....	2,178
Barge, Kelley, Spear & Co. ....	1,576
Barge, Kelley, Spear & Co. ....	481
Ship, Arthur Sewall & Co. ....	3,288
Schooner, New England Co. ....	633
Schooner, Charles V. Minott .....	1,450
Barge, Kelley, Spear & Co. ....	311
Schooner, New England Co. ....	730
Barge, Kelley, Spear & Co. ....	1,585
Barge, Kelley, Spear & Co. ....	312
Schooner, Kelley, Spear & Co. ....	613
Steamer, William G. Small .....	28
Schooner, Percy & Small .....	1,288
Ship, Arthur Sewall & Co. ....	3,288
Schooner, New England Co. ....	677
Schooner, Frank S. Bowker .....	405

## RECAPITULATION.

13 schooners .....	14,662 tons.
8 barges .....	7,996 tons.
2 ships .....	6,576 tons.
2 steamers .....	181 tons.
1 tug .....	650 tons.

Total ..... 30,065 tons.

Government vessels launched in Bath this year were:

Class, name and displacement.	Cost.
Torpedo boat, Biddle, 167 tons.....	\$ 170,000
Cruiser, Cleveland, 3,200 tons.....	1,047,650

There are at present under construction in Bath yards, or under contract, the following not named in the above list:

Rig and builder.	Tonnage.
Battleship, Bath Iron Works .....	15,000.
Monitor, Bath Iron Works .....	3,235
Steam yacht, Bath Iron Works .....	550
Ship, Arthur Sewall & Co. ....	3,600
Schooner, Arthur Sewall & Co. ....	3,000
Caissons, Bath Iron Works .....	2,000
Steamer, New England Co. ....	2,200
Schooner, New England Co. ....	2,500
Schooner, Gardiner G. Deering .....	1,800
Schooner, Percy & Small .....	2,300
Schooner, Percy & Small .....	1,550
Tug, Kelley, Spear & Co. ....	600
Barge, Kelley, Spear & Co. ....	137
Barge, Kelley, Spear & Co. ....	1,700
Schooner, F. S. Bowker .....	400
Schooner, Kelley, Spear & Co. ....	1,800

Tonnage not completed ..... 42,372

The contracts involve an outlay of \$9,510,150, or \$2,585,650 more work to the credit of 1901 than there was to that of 1900.

## THE WALDOBORO DISTRICT.

A summary of the ship building in the Waldoboro district in Maine for the period between January and November shows that vessels aggregating 10,350 gross tons and costing approximately \$486,200, have been built and launched. These figures include two five-masted schooners, three four-masted schooners, one three-masted schooner, one two-masted schooner, two steamboats and 150 tons of fishing and pleasure craft. There are still under construction or in course of construction eight vessels aggregating more than 8,000 gross tons.

At Rockland, Me., Cobb, Butler & Co. have launched two vessels. The first was the five-masted schooner Rebecca Palmer, which was sent overboard in March. The Palmer registered 2,556 gross tons, cost \$100,000, and was built for William F. Palmer and others of Boston. Upon a recent voyage abroad she created a sensation in French and English waters and unusual honors were bestowed upon her captain. The second vessel built this year by the firm was the four-masted schooner Jacob M. Haskell, built for Crowell & Thurlow of Boston and launched in August. She has a gross tonnage of 1,778 and cost about \$75,000. Cobb, Butler & Co. are now constructing a three-masted schooner of about 450 tons, to cost \$33,000 and to launch in January. I. L. Snow & Co. of Rockland launched the three-masted schooner Metinic in June. She is 261 gross tons, was built for the Snow fleet, and cost about \$23,000. The same firm will launch the latter part of December or the first of January a three-masted schooner of 350 tons, to cost about \$26,000.

At Thomaston two large vessels have been built and two larger ones are on the stocks. In August Washburn Bros. launched the four-masted schooner Joseph G. Ray of 1,253 gross tons. She cost \$64,000, and is owned by the builders and parties in Boston and Franklin, Mass. About the middle of December the same firm will launch the largest schooner ever built in Thomaston—a five-master of 1,750 gross tons, costing in the neighborhood of \$80,000. Washburn Bros. also have under contract two four-masted schooners, the frames for which are now being cut in Virginia. Dunn & Elliott of Thomaston launched the four-masted schooner William H. Yerkes in August. She has a gross tonnage of 1,498, was built for Capt. Wade of Waldoboro, and cost about \$70,000. The same firm will launch a four-masted schooner of 1,500 tons, in December.

At Port Clyde there has been one launching this year—the steamer Mineola, built for Capt. I. E. Archibald of the Rockland-Portland line. The steamer has 290 gross tons. The hull cost \$15,000 and the steamboat complete about \$35,000. The launching took place in April.

At Waldoboro, in October, George L. Welt launched the five-masted schooner Baker Palmer. She measured 2,792 gross tons, cost about \$100,000, and is owned by William F. Palmer and others of Boston. Mr. Welt has just begun work on a schooner of 2,000 tons for the same parties.

At Damariscotta no large vessels have been built this year. A. & M. Gamage built the schooner Mable E. Bryson of 39 tons, and the Damariscotta Steamboat Co. has built the steamer Bristol, 35 tons. Another steamer of about 50 tons is under construction for the Damariscotta Steamboat Co., and a schooner of 800 gross tons will be built this winter for Damariscotta and Baltimore owners. The usual number of fishing and pleasure craft has been built in the Waldoboro district this year.

## ROCKPORT, CAMDEN, BELFAST AND BUCKSPORT.

At Rockport, Me., Carleton, Norwood & Co. launched a four-masted schooner of 613 gross tons and costing about \$40,000. The yard was then cleared for the construction of a four-masted schooner of 1,200 tons to be controlled by the builders and costing about \$70,000. Camden, in the Belfast district, has ranked next to Bath as a ship building port on the Maine coast. H. M. Bean has launched there the following vessels: In January the five-masted schooner Van Allans Boughten, 2,256 gross tons, costing \$110,000; in April the four-masted schooner J. C. Strowbridge, 1,500 tons, costing \$65,000; in September the five-masted schooner Arthur Seitz, 2,228 tons, costing about \$110,000. In the spring Mr. Bean will build two more large schooners, one of which will be a five-master of 2,250 gross tons, costing \$110,000.

The Henry B. Fiske, four-masted schooner, was built by George A. Gilchrist at Belfast. She is of 847 gross tonnage, estimated cost \$50,000, and is owned by George A. McQuesten & Co. of Boston.

George A. Gilchrist of Belfast has a contract for a dredger for the United States government, which will be of about 1,000 tons and is to cost \$150,000. She is to be a steam propeller with sand pumps, and is to be used on sand bars in southern harbors. She is to be rushed along and finished next June.

The Thames Ship Building Co. has recently erected a modern marine railway plant at Riverside, just north of New London, at an expense of \$300,000. The water approach to the ways has a depth of 21 ft. and the largest vessels plying Long Island sound can be hauled out safely for repairs. It is the intention of the company to build vessels at the yard at an early date.

Aside from yacht work, lighters and barges, less than 3,000 tons of new vessels have been commenced or launched in East Boston and Chelsea during 1901, these vessels being wholly of wood. The only steel vessel constructed was the yacht Alicia, built by the Atlantic works in East Boston.

At the ship yard of William McKie, East Boston, the 500-ton steamer New Shoreham was launched in March. She was built for the Block Island service and cost \$75,000. A four-masted schooner of about 1,200 tons is at present being built in the same yard. She will probably be launched this year and will cost between \$55,000 and \$60,000.

At the yard of John M. Brooks, Harbor View, the keel has been laid for a new 3,200-ton five-masted schooner, to cost about \$160,000. This vessel is designed for the carrying of coal and general freight and will be followed by a six-master of the same tonnage and cost. Neither will be launched this year.

The only new work at the yard of Montgomery & Howard, Chelsea, has been the construction of a new 500-ton steamer for the Nantasket Beach Steamboat Co. This craft will cost about \$125,000.

The other Chelsea ship builder, Richard T. Green, has this year built three large lighters, but no sailing vessels. These lighters are designed for the carrying of lumber, and their building has practically meant the creation of a new industry. They look like immense house boats, are 135



ft. long and 35 ft. wide, and the house in which the lumber is stored is 9 ft. high. They will carry between 450,000 and 500,000 ft. of lumber, none of it below deck, and their cost is between \$8,000 and \$9,000 each.

The total tonnage built and contracted for during the year in these districts is approximately as follows: East Boston, tonnage 3,700, cost \$235,000; Chelsea, tonnage 900, cost \$150,000.

#### THE LESSER CRAFT.

The following list of small vessels, built or building in various sections of Maine, is not included in the summary of tonnage given in the opening paragraph of this article:

In the Portland district only two vessels have been built this year, both steamers. One, 141 tons, was built by the Portland Ship Building Co.; the other, 23 tons, by C. W. Howard. There has been no ship building in the Saco district.

In the district of Kennebunk David Clark of Kennebunkport has launched a four-masted schooner of 496 tons, and Charles Ward has a steamer of 70-ft. keel on the stocks.

In the Wiscasset district the following craft have been launched:

Rig and builder.	Net tonnage.
Naphtha screw, W. I. Adams, East Boothbay.....	68
Naphtha screw, F. Murray, East Boothbay.....	9
Steamer, W. I. Adams, East Boothbay.....	10
Schooner, W. I. Adams, East Boothbay.....	49
Schooner, W. I. Adams, East Boothbay.....	83
Schooner, W. I. & C. E. Hodgdon, East Boothbay.....	43
Schooner, W. I. & C. E. Hodgdon, East Boothbay.....	36
Schooner, C. Hodgdon & Son, East Boothbay.....	8
Sloop, C. H. Cunningham, Edgecomb.....	6
Total .....	312

W. I. Adams has rebuilt and enlarged the schooner Emma W. Day, 81 tons. There are three vessels on the stocks at East Boothbay, two of which will be launched before Jan. 1.

There promises to be a revival of the ship building industry in the Bangor district the coming year. Although no vessels have been launched this season, E. & I. K. Stetson of Bangor will construct a 1,000-ton schooner of four masts at their yard in Brewer this winter. Plans for a two-masted schooner are being considered by T. F. Cassidy & Son of Bangor. An excursion steamer 120 ft. in length is building for the Bangor & Bar Harbor Steamboat Co. in the Barbour yard at Brewer. She will be launched and ready for the summer business. The schooner Annie P. Chase was practically rebuilt the past summer and fall in the Stetson yard at Brewer.

McKay & Dix at Bucksport have launched the five-masted schooner John W. Paul, Jr., 1,652 tons, in the Castine district. She is said to be the smallest five-masted schooner afloat. The reason for putting in so many masts is that her sails being smaller, they can be handled more readily. She will differ from all other vessels of her number of masts in having a spike bowsprit. The firm will build a schooner of 600 tons this winter, the frame now being in their yard. She will fill the vacancy in their fleet occasioned by the wreck of the Thallima. She will be in readiness for sailing in the spring. The firm may build other vessels next year. J. J. Billings of Deer Isle has built the sloop Evanelia, seven tons, this year.

In the district of Frenchmen's bay a sloop of 11 tons has been built by Harvey Hodgkins and O. D. Wentworth of Marlboro. A small fishing schooner of six tons has been launched at Hancock. The following vessels have been rebuilt: Steamer-schooner by A. E. Farnsworth, S. W. Harbor, eight tons; schooner, by Charles H. Curtis and James Lord, Ellsworth, 129 tons; schooner, by Charles H. Curtis, 165 tons.

Three schooners have been launched in the Machias district, one of 297 tons, Sawyer Bros., Millbridge; 296 tons, E. T. White; 1,239 tons, Warren Sawyer. There are none on the stocks, but it is reported that Sawyer Bros. will lay the keel for a schooner this winter.

The building in the Passamaquoddy district has been confined to small vessels. Lyman Pushee, at Lubec, has built two steamers, one of 20 tons, the other much smaller. R. W. Spear built a sloop of nine tons at Eastport, and William Kierstead, at the same place, a sloop, 11 tons. Samuel Vanner launched a 13-ton schooner at Eastport; Frank Hallett, a sloop of 14 tons at Lubec.

### THE NEW SHIPPING BILL.

#### THE COMMISSIONER OF NAVIGATION POINTS OUT ITS RADICAL DIFFERENCE BETWEEN THE PRESENT BILL AND THE ORIGINAL FRYE BILL.

Mr. Eugene Tyler Chamberlain, commissioner of navigation, has been interviewed by the Boston Evening Transcript on the new shipping bill. The interview in detail is as follows:

"What is the difference between the Frye subsidy bill and the bill of last session?"

"The first difference is the sharp distinction it draws between mail steamers and cargo steamers. The Frye bill treats of mail steamers in a separate title or chapter. The former bill considered all steamers in the same chapter. The distinction existed in fact just as much under the old bill as under the new, but it seemed impossible to make clear the difference which is one of marine construction and postal policy. The majority of 14-knot foreign steamers are or have been under mail contracts. The criticism was made last year that the mail steamers drew most subsidy and carried least bulk cargo. It was true, but about as pertinent as to complain that a general gets more pay than a captain, but does less fighting. There can be no confusion of thought in this bill between the mail steamer and the cargo steamer. The former generally will come into direct competition with foreign subsidies, the latter generally will not.

"The principal difference in substance is the omission of the contract feature in the general subsidy. That feature committed the nation to the policy for fifteen years, even if the bill should have been repealed the next year. It necessitated a money limit to the policy. The omission of that feature does not commit the nation to the policy or to any expense, longer

than the president and congress see fit to continue it. It gives congress a much firmer grasp upon these expenditures than it has, for example, over continuing appropriations in river and harbor bills. Right here let me say that there has been much nonsense—to use no stronger word—about the expenses under this general subsidy. On the basis of last year's navigation the cost would have been about \$1,100,000, if every American ship involved had complied with all the conditions. One of these was free transportation of the mails for which about \$125,000 was paid to vessels concerned."

"What would have been the expenditures under the mail contract chapter?"

"Precisely what they were. The bill does not affect existing contracts. Our contract with the Oceanic line to Australia does not expire until 1910, and with the Admiral line to Jamaica until 1909, so those contracts are not involved for years. The contract with the Red D to Venezuela is to be renewed in less than a month for ten years, so that is not involved. The contract with the New York & Cuba Mail expires next September, and if it gets the maximum possible under the new bill, it would receive for its new mail contract about \$30,000 more than it now gets, and the postmaster general does not now pay it the maximum under the law of 1891. The contract with the American line to Southampton does not expire until 1905. In some quarters it has always been regarded as an impertinence that there should be an American line to Southampton. Even if the postmaster general should renew its contract under the maximum terms of the bill that company in 1906 would get about \$240,000 additional on its complete service. You know as well as I do that the real hostility to the bill is not based on an amount of \$270,000 four years off, which two American companies might get, if the postmaster general deems proper. With their eyes open men who swallow a river and harbor camel will not strain at that subsidy gnat.

"The real hostility to the ocean mail chapter is to the new ocean mail routes which it makes possible. Of the cost of these I can say that for a sum about equal to British subsidies to the Peninsular & Oriental, Canadian Pacific, Royal Mail, Cunard and White Star lines we can have a better mail service than theirs to Japan, China, the Philippines, Australia, Hawaii, South America, and across the Atlantic to Northern Europe, and that a superior South American service would cost no more proportionately than the German service to Africa. Suez canal tolls will enable us to secure these general results in spite of the greater cost of our ships and the larger pay of our crews. I say the real hostility—I mean the vociferous hostility which seeks cover under 'American line,' 'Standard Oil'—which, by the way, on last year's voyages would have received the royal grant of \$3,500, not enough to pay for the 'boiler-plate' opposition to the bill—'campaign corruption funds,' 'Pacific Mail jobbery' and all that sort of thing. Opposition on principle to all kinds of government aid, regardless of form or amount, or of the interests aided, of course commands respect."

"Why does not the bill make the general subsidy proportionate to the cargo carried, if its object is to promote the export trade?"

"The United States has pledged itself repeatedly that if it pays a bounty on exports in American ships it will pay the same bounty on exports in foreign ships. France, Italy and Japan in their navigation bounty projects have carefully observed the spirit as well as the letter of similar treaties. We cannot for a moment consent that the United States shall be less scrupulous in observing its international obligations. It is subterfuge to pretend to base navigation bounties on the size of the ship, and then provide that in fact they shall be paid on export cargo carried in the ship. The subsidy, in fact, would be an export bounty, and no amount of pettifoggery can disguise the fact.

"Take the treaty of the United States with Hamburg and Bremen. And they further agree that whatever may be lawfully exported or re-exported by one party in its own vessels to any foreign country may in like manner be exported or re-exported in the vessels of the other party. And the same bounties, duties and drawbacks shall be allowed and collected, whether such exportation or re-exportation be made in vessels of the one party or the other.' With that pledge, which we have honorably kept for seventy-five years, before him the American who continues to advocate subsidy based on export cargo means only one of these three things:

"First. That the United States should, for example, pay the North German Lloyd and the Hamburg-American lines, which own 75 per cent. of the ocean steamers of Bremen and Hamburg, the same subsidies that are proposed for American ships—a plan which, of course, would help foreign shipping more than American, because there is much more of it.

"Second. That the United States should pay bounties on exports to American and not to German vessels, and deliberately break faith with another nation—a price too big to pay for American ships, even if we have to go without them forever.

"Third. That the way to attack the shipping bill is to lead men to believe that a direct subsidy on export cargoes in American ships only is feasible and that congress will betray the interests of exporters if it does not provide subsidy on that basis.

"Naturally there are thousands of Americans who are not familiar with our treaties—and only one out of a dozen applicable has been quoted—and their support of a subsidy on exports to promote American shipping can be understood. It is sincere, and such advocacy usually yields to a statement of the facts. Of the three classes mentioned who know the treaties, the first class does not care for American ships, and frankly says so. The second is small, blatant and impotent. The third class pays to the bill the tribute which intellectual dishonesty has often paid to a public measure which admits of a fair fight in the open. Our military argot has recently been enriched by the word 'amigo,' the Filipino whose pleasant words by daylight are a prelude to a bolo thrust in the back by dark. The 'amigo' is not regarded as a 'nice sort of man.' The word we got with our new possessions. The thing we have had for over 100 years."

"The foreign-ship section is not included in the Frye bill."

"I regret that a provision of some kind is not made for the registry of foreign ships owned by Americans. They are a large factor in the situation."

A chart of Ashtabula harbor in colors has just been issued by the engineer officers in charge of the lake survey and may be had from the Marine Review.

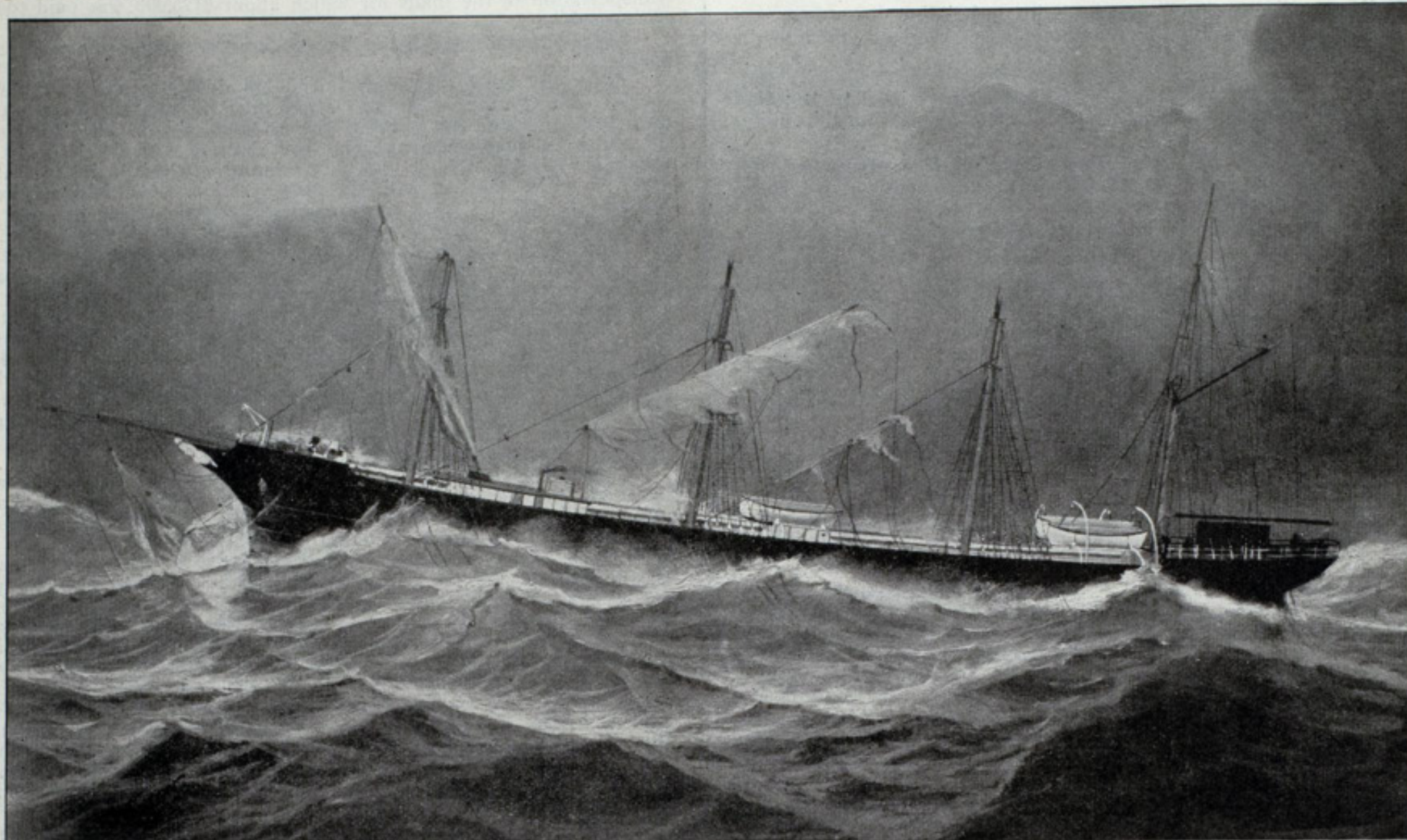


### REPAIRING THE GERMAN SHIP WILLY RICKMERS.

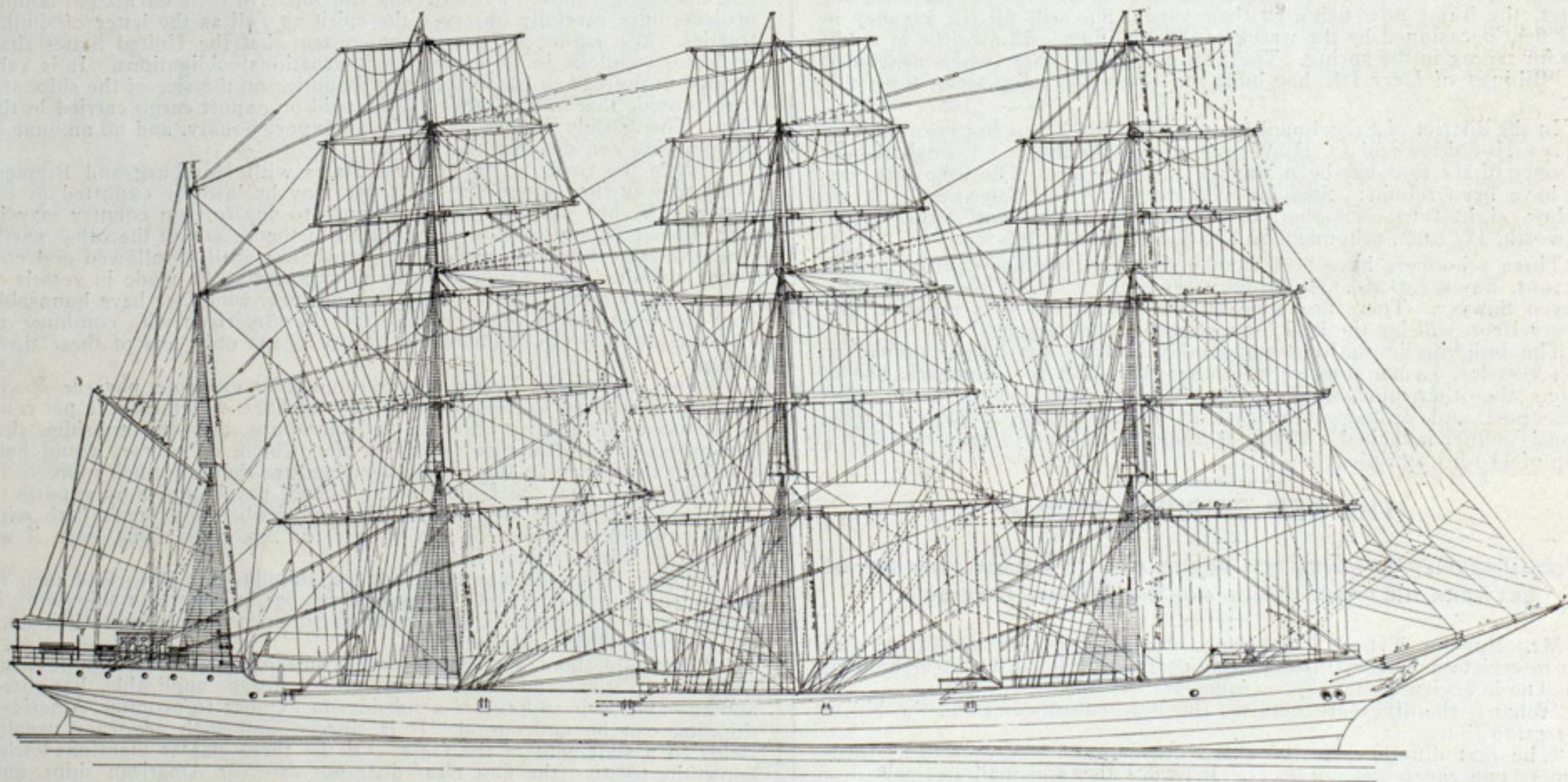
The German sailing ship Willy Rickmers, which was badly damaged some time ago in a storm, is at the Risdon Iron Works, San Francisco, undergoing extensive repairs. The half-tone on this page gives an idea of the damage done by the storm. The drawing from a blue print on this page shows the vessel as she will look when the Risdon Iron

### NEW OFFICERS AMONG LAKE SHIP MASTERS.

Buffalo lodge—President, Capt. J. H. Coleman; first vice-president, Capt. Walter Robinson; second vice-president, Capt. Charles A. Potter; secretary, Capt. John Perew; treasurer, Capt. John Hall; chaplain, Capt. Charles McMillen; marshal, Capt. Daniel Coughlin; warden, Capt. Alex-



A GREAT GERMAN SAILING SHIP, THE WILLY RICKMERS. Undergoing repairs at the Risdon Iron Works, San Francisco.



A GREAT GERMAN SAILING SHIP, THE WILLY RICKMERS. Undergoing repairs at the Risdon Iron Works, San Francisco.

Works is done with her. The topmast rigging, bowsprit and yards are to be renewed and the decks, bulwarks, rails and cabins will be overhauled thoroughly.

Daily newspaper dispatches have had much to say of late about the proposed combination of dredge interests on the great lakes. Promoters of this combination have been at work on it for about a year. Messrs. A. B. Wolvin, Edward Smith and others, who are prominent in the ship building and harbor tug combinations, have taken part of late in the negotiations with the dredge owners, and they have helped along the plans for a combination, but conditions prevailing in the money market have retarded success in the matter.

ander Kelley; sentinel, Capt. P. O'Neil; delegate to grand lodge meeting in Washington, Capt. J. H. Coleman; alternate, Capt. Walter Robinson.

Cleveland lodge—President, Capt. S. C. Allen; first vice-president, Capt. C. H. Woodford; second vice-president, Capt. A. J. Greenley; treasurer, Capt. Thomas Jones; secretary, Capt. O. Oleson; delegate to grand lodge meeting in Washington, Capt. S. C. Allen; alternate, Capt. J. A. Holmes.

The Toyo Kisen Kaisha purposes adding two new steamships to its line from San Francisco to the Orient. The new steamers will each be 545 ft. over all with a cargo capacity of 11,500 tons. They will be equipped with engines of 15,000 H.P. and are expected to make 19 knots.



## BRITISH NAVAL GUNNERY.

Rear Admiral S. Eardley-Wilmot in the Engineer of London.

Though the principal object of a battleship or cruiser is not only to carry guns but also to use them efficiently when required, it is curious that this has not in the past received full recognition, at any rate in our own navy. I therefore read with satisfaction, though tinged with doubt, in "Notes on Naval Progress for 1901," issued by the naval intelligence bureau at Washington: "The question of good shooting is now regarded as of paramount importance by every nation which possesses warships. Naval battles are decided by the accuracy and rapidity of firing more than anything else." Strange though it may seem, there has been from time immemorial a prejudice against gunnery in the minds of a majority of our officers, who, for some obscure reason, long considered it incompatible with the other attributes of a seaman. I vividly remember, as the gunnery lieutenant of a ship, the astonishment of the navigating officer—one of the old school—at my bringing our cutter in first at a sailing regatta. He did not think that any gunnery Jack could be a sailor in the sense of a knowledge of masts and sails. Whether it was equally strong in the time of Nelson I do not know, but gather there was some reason for the memorandum issued to the Mediterranean fleet by Sir John Jervis, afterwards Lord St. Vincent, when he took command in 1795. "He had observed that in all warfare where artillery is used the greatest successes were found on the side of the best gunners; and also that of all exercises, those that seemed the most important, namely, the military drills, appeared to him to be the most neglected. It is of the first importance that our crews should be perfect in the use of their guns. I therefore wish that every day, whether in harbor or at sea, a general or partial exercise should take place on board every ship in the squadron." Under his strict and vigilant supervision the gunnery of our ships much improved. It was in rapidity of fire that our seamen excelled, due to their physical strength and activity. When ships engaged at pistol shot, or even closer distance, minute accuracy of aim became of minor importance. Every shot told, and as one of the French naval historians has recorded that their best served guns only fired about one round every three minutes to the English one per minute, we can realize the effect of half an hour's cannonading in those days. Unfortunately, when no longer under the eye of a man like Jervis, captains relapsed into their old attitude of indifference to gunnery, so that on meeting an equally brave and better trained enemy on the other side of the Atlantic in 1812 we lost several single-ship actions. In his history of that war Theodore Roosevelt says: "A continuous course of victory won mainly by seamanship had made the English sailor overwhelmingly self-confident, and caused him to pay little attention to maneuvering or even to gunnery. While the American seamen were constantly firing at marks, the British seamen, except in particular cases, scarcely did so once in a year. Many captains never put a shot in a gun until the enemy appeared; they employed the leisure time of the men in handling the sails and decorating the ship." A notable exception was the Shannon. Sights were fitted to her guns, and the crews exercised at them every day. They also frequently fired at a target. The reward was reaped when they met the Chesapeake. These smooth-bore iron guns, with their wooden carriages, were most crude appliances for projecting shot. They gave frightfully inaccurate shooting at any range over 400 yards, which accounts for the old fleets sometimes engaging each other for half the day without inflicting material damage. And seeing what advance has been made in naval artillery during the last twenty years, it is astonishing to think the old ordnance remained with us up to 1860. Then came a period of invention and experiment. Rifled guns, iron carriages, and improved powder all helped to give increased accuracy. In 1864 France adopted breech loading. We in the same year rejected that system and returned to a muzzle-loader. The decision hampered us for years, and does so still as regards many ships still armed with these weapons. For it prevented us giving that length to the gun which velocity of projectile demanded and improved powder warranted. Our ordnance varied in length from 12 to 15 calibres, the shortest being the 12-in. 25-ton gun, which was 12 calibres long; while the velocity varied from 1,300 ft. to 1,500 ft. per second. We thought highly of the 38-ton gun, because, with only three tons more metal than in the 35-ton gun and half an inch larger bore, we obtained a velocity of 1,560 ft. per second, the length of bore being nearly 16 calibres. We are so fond of this gun, that it is still retained in the Dreadnought, Ajax and Agamemnon.

As the first breech-loader adopted in 1880 had a velocity of 1,800 ft. and was over 25 calibres long, while we have now reached a 50-calibre gun with a velocity of 3,000 ft. per second, we can realize how that unfortunate decision of 1864 long kept us back in naval artillery. The guns were little better than howitzers, requiring great elevation at distances of 2,000 yards and upwards, and consequently unlikely to hit a moving object at sea. With a muzzle velocity of 1,000 yards per second, there is the immense advantage of a trajectory so flat that, within a certain range, elevation above the horizontal is not required where the target is the hull of a ship. Then the present mountings are free from the causes of inaccuracy in former carriages, and allow the gun to be freely moved in a horizontal and vertical direction, while the sighting apparatus enables it to be laid true. Quick loading has been furthered in several ways, so that now rapid and straight shooting at sea depend mainly upon the efficiency of the gun's crew. If this was perfect every shot at target practice should be a hit. That we find great variation in the returns from different ships, and a large percentage of misses, indicates that the training is far from perfect, and it would almost seem as if sufficient importance is even now not attached to this subject generally in the fleet. Take, for instance, the result of prize firing in the Mediterranean fleet for 1899. The points per gun made by the battleships varied from fifty-two to thirteen, while one cruiser made seventy-eight points per gun. Some of these vessels had more modern armament than others, but still such a difference should not be observed in shooting at the service target at the comparatively short range prescribed. As showing, on the other hand, what may be done by careful training, the Barfleur, on the China station, has so improved the shooting of her four 10-in. guns since she commissioned as to give a result with them six times better than they achieved in 1899. On that station the admirals and officers of the squadron have presented a challenge shield to be held each year by the ship making the best score at the annual prize firing. A certain amount in money is given for prizes by the admiralty to every ship for the guns which make the best scores at the annual prize firing, but there is no distinction made between a good ship

and an indifferent one in the aggregate result. More money prizes are not required, but honorary distinctions to ships, officers and men that excel in great gun shooting would be appreciated. A bluejacket is as proud of a badge as an officer is of a C. B., but he carries nothing to show that he is a marksman with a 4.7-in., 6-in., or 12-in. gun. What issues depend upon directing with precision in action the 850-lb. projectiles from the 12-in. guns of the Majestic! The individuals who waste the fewest of these shots should be held in honor and cherished. Then as regards the officers by whose assiduity and zeal good results are attained. What a stimulus to improved shooting would the occasional promotion of an officer for efficient gunnery in sea-going ships give. Is not too much thought, even now, of "decorating the ship," as Roosevelt says of 1812? I can recall to mind, not so many years ago, how the promotion of one of the ablest officers in the service was imperilled because he neglected the paint work in his labor to increase fighting efficiency. How many admirals when inspecting ships have reported favorably on their capability for engaging an enemy successfully, owing to good shooting—a matter quite apart from smart handling of the guns with dummy charges? Has it not been the custom rather to commend for less essential things in which spotless paint work and stanchions burnished to the brightest of mirrors assume no unimportant part? Training of some sort goes on every day afloat, but how much of it is directed towards straight shooting with the guns? Yet that is a matter upon which too much time and care cannot be bestowed. Quickness and accuracy of aim are the first essentials, and though impeded by the motion of the ship, they can be greatly developed by good methods and continuous practice. It is not necessary to expend a large amount of ammunition to make marksmen with heavy guns. Capt. Percy Scott has demonstrated in the ships commanded by him that a high standard can be attained without exceeding the allowance prescribed for the fleet. He has devised an apparatus to train men in keeping the sights of a gun on the object, independent of any rolling motion the ship may have at the time, instead of waiting until the roll brings the object in line with the sights, as has hitherto been the practice with heavy guns. Thus time is saved and quick-firing is secured, as well as rapid loading, with ordnance that cannot be given vertical movement by a shoulder piece, while it also tends to greater precision with the smaller guns. The first thing in training, however, is to find out who are most likely to make good shots. These are usually born, not made. Some men have a natural aptitude for it; many no amount of training nor practice will render otherwise than indifferent in this respect. It is waste of time and ammunition trying to improve them, and such men should not be allowed to fire precious rounds at a target, thereby reducing the amount available for those who would really benefit by it. To ascertain who have this aptitude is easy, and does not require the expenditure of much ammunition. It may be found where least suspected, but none the less all should pass through the test. Then, again, it is not unusual for a man to shoot well for two or three rounds, and then fall off lamentably, due to some peculiar condition of the eye, which apparently tires. When ascertained such a man should be put on one side as not a reliable shot. In the German artillery every gunner passes through this test, and thus the best marksmen are secured. They do not fire many practice rounds—cannot afford it, they say—and not necessary—yet we may be sure their artillery is efficient. Whether our navy compares favorably or unfavorably in great gun efficiency with foreign fleets I do not know. To ascertain this with accuracy would require presence with each on more than one occasion when practice is carried out. I do trust, however, that nothing will be left undone to ensure the best results being obtained from the admirable guns now furnished to our ships when the real thing comes, and that the nation may not look in vain for the success it anticipates.

## NEW OFFICERS AMONG MARINE ENGINEERS.

Saginaw (Mich.) lodge—President, A. G. Moll; vice-president, Richard E. Nantell; chaplain, W. P. Whalen; treasurer, John Henry; financial secretary, Walter Henry; recording secretary, Geo. A. Thresher; corresponding secretary, Harry E. McArthur; conductor, Alexander Frazer; doorkeeper, Fred Pflueger; representative to national convention, John Henry.

South Haven (Mich.) lodge, No. 102—President, W. H. Tyler; vice-president, Chas. W. La Bounty; recording secretary, Harry E. Bullen; corresponding secretary, Fred. W. Linsemeyer; financial secretary and treasurer, Perry N. Knaggs; board of trustees, Perry N. Knaggs, A. C. Krogman, Ralph Peterson; representative to national convention, Perry N. Knaggs; alternate to convention, Walter L. Rounds.

Duluth (Minn.) lodge, No. 78—President, Lewis Griggs; first vice-president, R. F. Barrows; second vice-president, John Plase; secretary, F. A. Rehder; treasurer, Armour Harvey; trustee, J. P. Burg; delegate to national convention, R. F. Barrows; alternate to national convention, L. McNamara.

Thunder Bay lodge, No. 85, Alpena, Mich.—President, Horace Carter; vice-president, William Hamilton; recording secretary, Chas. Warwick; corresponding secretary, G. H. Miller; financial secretary, Chas. Warwick; treasurer, Harry D. Irwin; trustees, William Hamilton, Thad. Kneale, Richard Piepkorn; representative to national convention, Chas. Warwick; alternate to convention, William Hamilton.

Executive officers of the Lake Carriers' Association a few days ago adopted resolutions commending the service of Col. G. J. Lydecker, who has been in charge of important river and harbor works at the Sault and in the vicinity of Detroit, and petitioning the chief of army engineers to reconsider the order by which Col. Lydecker has been transferred to Cincinnati. It is not at all probable, however, that the resolutions will have any effect in Washington. They are a compliment from the association to Col. Lydecker, but alike to other measures of the same kind, often adopted in different parts of the country, will not have much force with the heads of the war department.

In recognition of the services rendered the firm and with the desire of giving its workers some share, over and above their wages, the Crane Co. of Chicago on New Year's eve distributed among its employes the sum of \$125,000 as a New Year's gift. Every person in the employ of the company, from office boys up to the treasurer, 3,500 men and women in all, received a sum equivalent to 5 per cent. of the money each has earned in 1901.



### LAUNCH OF THE SHAWMUT, 11,200 TONS CAPACITY.

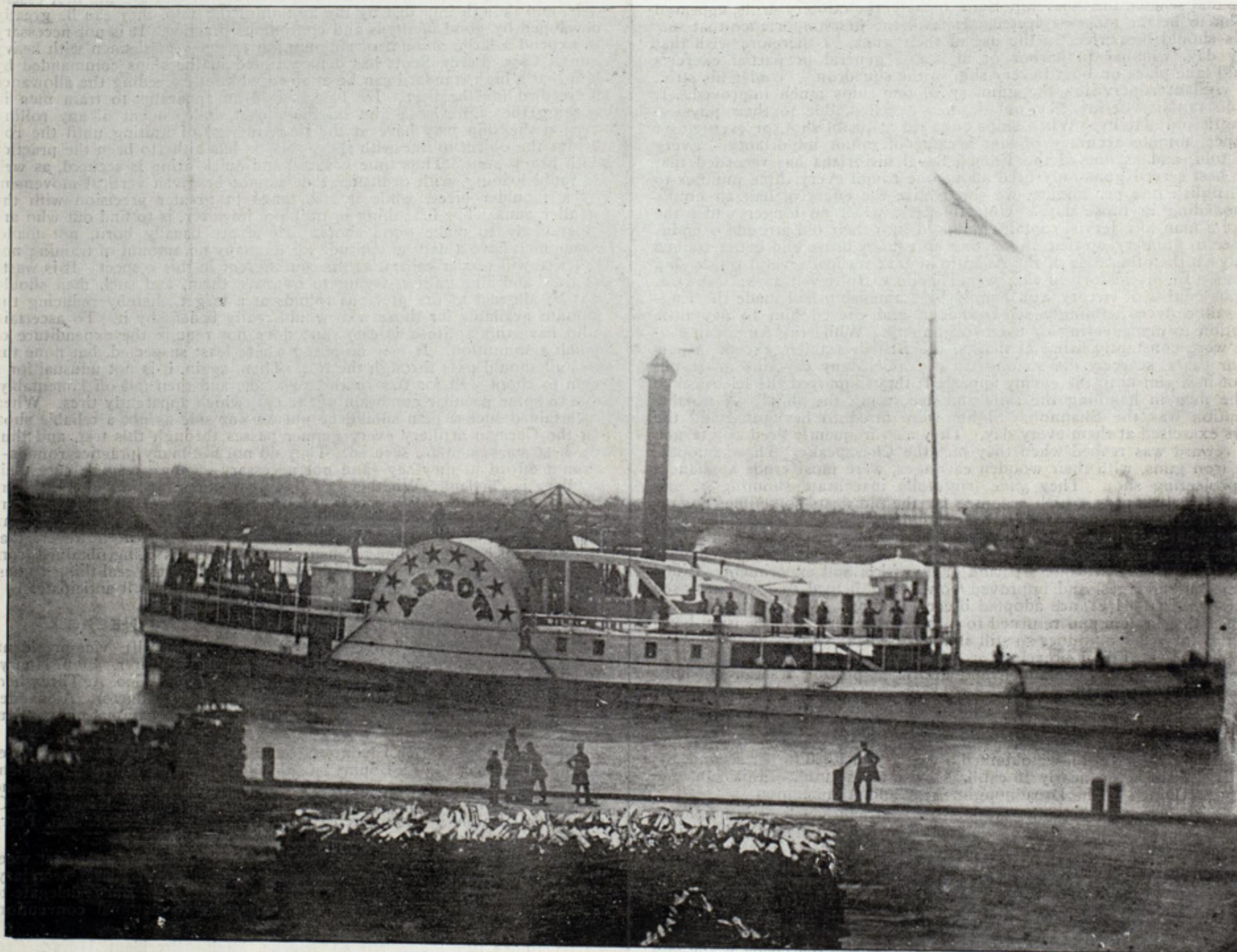
There was launched a few days ago at the works of the Maryland Steel Co., Sparrow's Point, Md., the large freight steamer Shawmut for the Boston Steamship Co. This is the largest freight steamer up to the present time launched in this country, and will only be exceeded in carrying capacity by the 630-ft. vessels, now building at New London. The vessel is constructed of steel of the best quality, to the rules of the British Corporation and the American Bureau of Shipping, and is built under the three-deck rule with a continuous shelter deck and bridge for 170 ft. amidships on the shelter deck. The vessel has a straight stem and elliptical stern, and is rigged as a two-masted schooner. She has six water-tight bulkheads extending to the upper deck and one water-tight bulkhead extending to the main deck to form a deep tank abaft the machinery space. Of these six bulkheads the forward and after peak bulkheads extend to the shelter deck. Two partial bulkheads extending to the main deck form a reserve bunker forward of the boilers and a division bulkhead between the engine and boiler rooms.

The vessel has three complete steel decks and steel bridge deck. The double bottom is built on the cellular system and extends from the fore peak forward to the stern pipe bulkhead aft. There are nine hatches extending through all the decks, fitted with wooden covers and the nec-

water for the condenser. There will also be an electric lighting plant. This vessel is intended to carry 11,200 tons dead weight cargo and coal on 27 ft. 4 in. mean draught, and is expected in point of economy of operation and carrying capacity on said draught to exceed boats of the same size and type built in Europe.

### THE OLD STEAMER ARROW.

On the present page will be found a reproduction of the old steamer Arrow, which was, in her day, one of the swiftest and best on the great lakes. The steamer was built at Trenton, Mich., by Eli Bates and was towed to Cleveland where she was equipped with her engines at the old Cuyahoga works, a concern that was bought twelve or thirteen years ago by the Cleveland Ship Building Co., now a part of the lake ship building combination. A low-pressure engine, 40-in. cylinder with 9-ft. stroke, was installed in her, together with an iron boiler 24 ft. long and 9 ft. wide. Cordwood, as will be seen from the picture, was the prevailing fuel of those days. She ran between Port Huron and Toledo in 1848 and between Detroit and Sandusky from 1849 to 1852. From 1853 to 1856 she was on the Detroit and Toledo route and from 1857 to 1859 she ran between Buffalo and Niagara Falls. She was 185 ft. long, 24 ft. beam and 9½ ft. deep. On the Detroit-Sandusky run her captain was S. F. Atwood,



THE OLD STEAMER ARROW.

essary strong backs. There will be ten derrick posts which will also be used to ventilate the holds. On the derrick posts there will be twelve booms, 45 ft. long; in addition to these there will be four booms on each mast. Twelve steam winches of large capacity will handle the cargo.

Accommodations for the crew are aft between the shelter and upper decks, and in the forecabin forward are fitted storerooms. The officers are accommodated in deck houses around the machinery space, and the captain's saloon and spare rooms are in the deck house forward, with the chart room and pilot house on top. The steering apparatus consists of the Brown Bros. steam tiller in a house aft.

The machinery consists of twin-screw triple-expansion engines 23½, 39¼ and 63 in. diameter by 45 in. stroke, for 200 lbs. pressure. The machinery is designed for 100 revolutions and is of the open-front inverted, fore-and-aft, triple-expansion type. There will be four single-ended boilers, 15 ft. 9 in. in diameter and about 10 ft. 6 in. long, designed for 200 lbs. working pressure. They are expected to develop 4,500 H.P. with Howden's system of hot draft. There will be the usual complement of pumps. One duplex fire and feed, two admiralty feed pumps, one admiralty ballast pump, one duplex salt and fresh water pump, and two simple deck pumps. A feed heater of the Worthington type is to be supplied. Two centrifugal pumps, driven by vertical engines, will supply the

on the Detroit-Toledo run, John Keith and on the Buffalo-Niagara Falls run, John Edwards, whose last command was one of the large side-wheelers of the Cleveland and Buffalo line, and who is held in great esteem by officials of that line. In 1859 her engine was taken out and placed in the steamer Dunlap—and thus endeth the steamship career of the Arrow.

Sugar imports into the United States in the calendar year, 1901, will exceed those of any preceding year by about 250,000,000 lbs., and the cost will be greater than any preceding year except 1893 when prices were unusually high. The total importations of sugar in the year about to end will, according to the treasury bureau of statistics, aggregate 4,670,000,000 lbs. and the cost about \$115,000,000. The highest record of sugar importations in any preceding year were, in quantity those of 1899, 4,309,749,078 lbs.; while in value, the figures of 1893 made the highest record, \$123,083,217.

It is reported from Oswego, N. Y., that the Kingsford Foundry & Machine Works at that place starts in the new year with all departments crowded to their capacity. Orders for sixteen large marine boilers are now on the books, and orders for their centrifugal pumping machinery are taxing the capacity of the machine department.



## LABOR PROBLEM IN BRITISH SHIP YARDS.

WITH ACTIVITY ABATING IN THE SHIP BUILDING INDUSTRY THE UNIONS WILL PROBABLY BE CALLED UPON TO MODIFY SOME OF THEIR ARBITRARY RULES—NEW SHIPS FROM THE CLYDE.

[Special correspondence to the Marine Review.]

Glasgow, Scotland—The close of the first year of the new century will, I expect, be marked by the conclusion of an arrangement that will inaugurate a new era in relations between capital and labor in this country—at all events, in the ship building and engineering industries. It is an agreement arranged between the executive boards of the Federation of Engineering Employers and of the Amalgamated Society of Engineers, as well as the trade unions involved in the agreement with which the great strike of 1898 terminated. The present is a continuation of that agreement, but with such revision and amendment as the experience of the past three years has convinced both sides to be desirable. In this new agreement the absolute control of management of the workshops, and of the allocation of labor to machine tools, is cheerfully and expressly conceded by the trade unions—just precisely what they always resisted up to and during the great strike. Further, the restrictions as to piece-work and apprenticeship are withdrawn, and many little causes of friction between employers and employed are removed. The great fact revealed and illustrated by this agreement is that strikes, lockouts and general misunderstandings can best be avoided by bringing responsible representatives of both masters and men into constant confidential personal relations. In the engineering trade the members of the respective executives have got to know each other as they never did before the strike and to acquire a respect for and a confidence in each other that have preserved harmonious relations and promoted business-like settlements. When the new agreement is given to the world (which cannot be until it has been ratified by the men, as is now being done) an object lesson will be given to other industries that cannot but have marked results.

Among industries needing a wholesome example and whole-hearted reform are those workers which are enrolled in the United Society of Boiler Makers and Iron Ship Builders, collectively and colloquially known as the "Black Squad." The riveters especially, who earn big wages, are most irregular in their habits—or rather regular in their misconduct—and throw a fearful amount of unnecessary expense upon the ship builder. It is not the extravagant wage they earn that is grudged so much as the amount of time and producing power they waste. This society should be brought under the same disciplinary methods as the A. S. E., and it is to be hoped the example of the A. S. E., will lead the way to peaceful reform. The prospects of the ship building industry are such that a reduction in ship yard wages will become a necessity early in the coming year. In anticipation of this the Clyde workers rather cunningly formulated the other day a demand for an advance. Of course they will not get the advance, nor is it probable that they expected it, but one way of delaying a fall is thought to be by demanding a rise. However, the demand has led to conferences and deliberations which may have far-reaching results.

It is, of course, difficult for workmen to realize that bad times are at hand when they are in the midst of active employment and see an enormous production going on around them. It almost seems like mockery to speak to ship yard hands on the Clyde of lower wages in prospect, when the output of the Scotch ship yards was 57,000 tons in November, and is still so active that the total for the year will doubtless reach 500,000 tons. But activity is already abating, and at two yards in the Greenock district a large number of men were paid off recently—ostensibly until after the New Year, but really sine die. There are no new orders coming in to replace the contracts that are being worked off. Nor is this surprising, for every week sees additions to the number of unemployed vessels laid up, not only on the Clyde, but in almost all the harbors in the country. So bad is the outlook for ship owners that many new cargo boats as they are being finished on contract by the builders are simply towed into dock, or some out of the way berth, and left there "till the clouds roll by." Yet there is still more tonnage under construction, or under contract, than at this time last year, and there is still a large amount of shipping under engagement in connection with the South African war which will be to a large extent set free by the termination of that war.

And this reminds me of an incident almost unique—the launch here of two new liners on the same day for the Union-Castle African mail line, but from two different yards. One of these, launched by Messrs. Barclay, Curle & Co., is named the Cawdor Castle. She is one of the Union-Castle Co.'s new type of vessel, built for the New York and South Africa service, and is fitted so that 300 or 400 emigrants can be accommodated at short notice, in addition to permanent accommodation for a limited number of first-class passengers and third-class passengers. This vessel has been constructed under Lloyd's special survey for their 100 A1 class, and to the board of trade requirements for a passenger certificate. She is of the shelter-deck type, built of steel, with teak decks, and her dimensions are: Length over all, 430 ft.; breadth, 51 ft. 3 in.; depth to the shelter deck, 38 ft. 9 in. Her gross tonnage is about 5,600. Water ballast is carried right-fore-and-aft in a cellular double bottom, and in addition amidships a deep tank is fitted, abaft the machinery. The vessel is fitted with the company's usual cargo discharging gear and winches, steam windlass, steering gear, etc. The machinery consists of two sets of triple-expansion engines, and four large single-ended boilers capable of developing 4,200 I.H.P., which is expected to give a speed of about 14 knots. An unusually large equipment of auxiliary machinery is provided for in the engine room, and the fittings throughout are all of the highest order.

The other addition to the Union-Castle fleet launched the same day is the Berwick Castle, built by William Beardmore & Co., the second of two similar twin-screw steamers they have constructed for the company. These vessels have been specially designed for the company's extra cargo service to South Africa, with a carrying capacity of 7,000 tons on a moderate draught of water, and a good sea speed. The general dimensions are: Length between perpendiculars, 400 ft.; breadth, 50 ft.; depth, moulded, to main deck, 29 ft. 8 in. There is a complete teak shelter deck carried right-fore-and-aft, and a cellular double bottom and deep tank for water ballast. The boats have been, of course, built to Lloyd's highest class under special survey, and in accordance with the board of trade regulations for passenger steamers. The most modern improvements have been introduced for the efficient working of the ship and the rapid

handling of cargo. Comfortable accommodation is provided for first-class passengers in a commodious deckhouse amidships. The saloon is finished in polished oak, and the large staterooms are furnished with the most up-to-date fittings for the comfort of the passengers. A large number of third-class passengers and emigrants can be carried in the 'tween decks. The refrigerating space is on the lower deck aft, with suitable machinery for maintaining the various chambers at a low temperature, and the steamer will have a complete installation of electric light. The machinery, which has been constructed by the builders, consists of two sets of triple-expansion engines with cylinders 21½, 35 and 58 in. diameter by 4 ft. stroke, with four single-ended boilers for a working pressure of 200 lbs. per square inch, fitted with most recent appliances for efficiency and economy, bronze propeller blades, etc.

The British cruiser *Bacchante*, built at the Clydebank works of John Brown & Co., Ltd., has just successfully completed her official series of steam trials. The first was for 30 hours at 4,500 I.H.P., when the results obtained were: Mean I.H.P., 4,624 with 75.2 revolutions per minute, corresponding to a mean speed of 14 knots. The coal consumption per I.H.P. per hour was 1.8 lbs. The second trial was for 30 hours at 16,000 I.H.P. and the average I.H.P. recorded was 16,445 with 112.7 revolutions per minute, and a mean speed of 20.6 knots per hour. The coal consumption was 1.75 lb. per I.H.P. per hour. On an eight-hours' full power trial the mean results recorded were 21,520 I.H.P. with 120.1 revolutions per minute and 1.7 lbs. of coal per I.H.P. per hour, the high speed of 21.75 knots being maintained as the average of the eight hours' running. The *Bacchante* is the second of the new type of armored and sheathed first-class cruisers built and engined by John Brown & Co. at Clydebank. The principal dimensions are: Length, 440 ft. by 69 ft. 7 in. beam, and at her load draught of 26 ft. 3 in., to which she was brought on trial, she has a displacement of 12,050 tons.

As another example of the multifarious products of the Clyde ship yards I may mention a vessel launched this week by the Clyde Ship Building & Engineering Co., Ltd., Port Glasgow, namely, a steel screw steamer called *Velazquez*, built for La Betica Co. of Seville, Spain. This vessel has been constructed to class 100 A1 at Lloyd's on the spar-decked principle, with long fore-castle, poop and bridge. She will belong to a large fleet of fruit carriers, and has been specially designed for the stowage and rapid handling of large quantities of fruit. The principal dimensions are: Length between perpendiculars, 238 ft.; breadth, moulded, 35 ft. 6 in.; depth, moulded, to spar deck, 21 ft. 10 in.; dead weight capacity of about 2,300 tons. The propelling machinery consists of a set of triple-expansion engines, with cylinders 19, 31 and 51 in. by 33 in. stroke, with a large single-ended boiler, 15 ft. 6 in. diameter by 10 ft. 3 in. long, at 165 lbs. working pressure.

The boiler committee of the admiralty is about to issue a report on the Hyacinth and Minerva trials, which, I understand, will declare that the trials of the Hyacinth clearly establish all the objections which the committee expressed in their first report to the Belleville boiler, both as to its defective circulation and its lack of economy, principally due to the loss of water, which is put at 55 tons per day for a 9,000 H.P. vessel. The committee, it is said, is decidedly of opinion that no more Belleville boilers should ever be fitted, but not disposed to make any recommendations with regard to the boilers already ordered or fitted into the ships. Among several points in engineering dealt with by the committee is the question of the length of stroke in the modern naval engine. In the earlier vessels of the protective-deck type, the cylinders were allowed to project higher than the level of that deck, and an armored cover was constructed round the engine hatchway. In later ships, however, the engines were placed entirely below the protective deck, and this required a greatly shortened piston stroke. In the Drake class the stroke is 48 in.; in the County class it is 42 in., but in merchant liners of corresponding power it is 72 in. In some later battleships with protective decks it is also 48 in. The committee thinks better results would be got if a longer stroke were given, to ensure a fewer number of revolutions for the same power. But, of course, ship builders will reserve judgment on this recommendation until the full report is at hand.

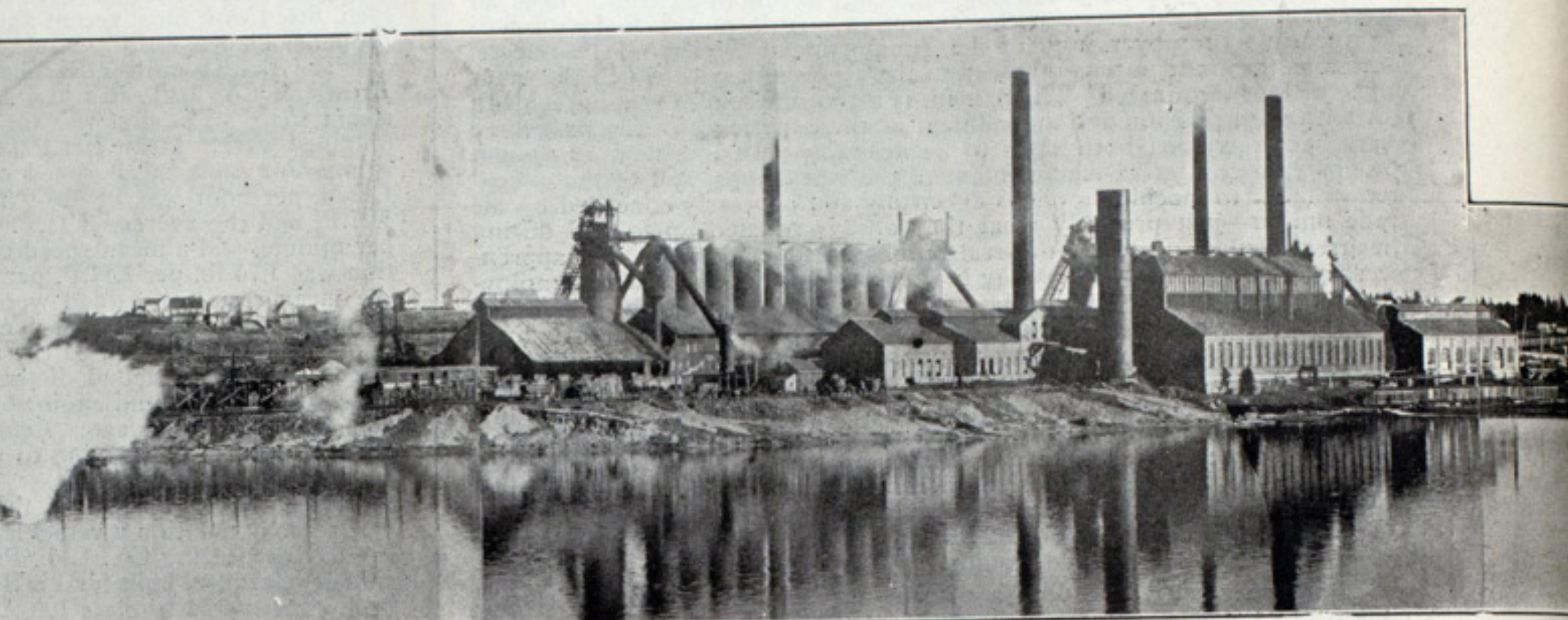
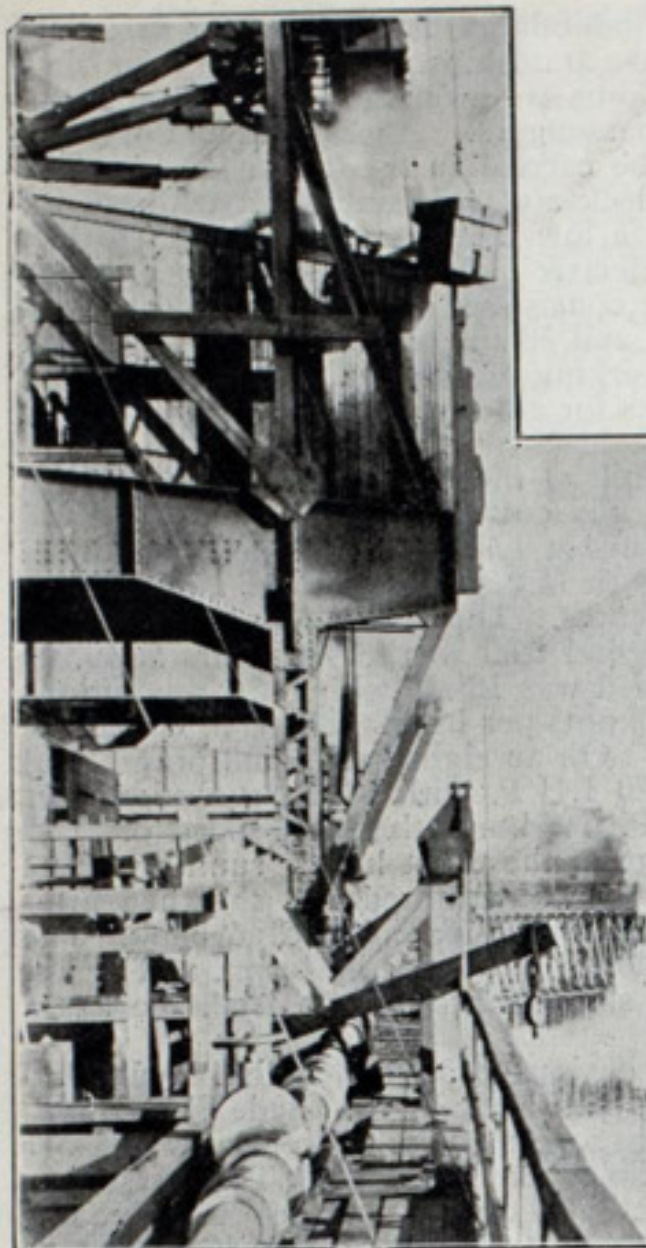
## CANADIAN ORE DEPOSITS.

Prof. C. R. Van Hise of the United States geological survey will devote some space in his forthcoming annual report to the Canadian ore deposits. An extract follows:

"The Vermillion iron bearing series has been traced by us to Hunter's island. These rocks have been mapped by the Canadian survey as extending first in a northeasterly and then in an easterly direction to the Kaministiquia river, and thence eastward to the Keweenaw rocks west of Lake Nipigon. Another great belt of iron-bearing rocks with various ramifications has been traced by the Canadian survey from Rainy lake eastward to the Canadian Pacific railway and to Lac Des Mille Lacs. In this belt occurs the so-called Atikokan range, in which large deposits of iron ore are said to outcrop. East and north of the east half of Lake Superior various areas of iron-bearing rock are also found. One or more belts are said to extend east from Lake Nipigon. A belt is found adjacent to the Black and Pic rivers. Several belts of iron-bearing formation have been found in the Michipicoten district. At the present time the only one of these districts which is an ore producer is the Michipicoten. While this district has not been connected areally and structurally with any other area in the lake region, the likeness in the character of its rocks and the succession to the Vermillion district leaves little doubt in my mind that the two districts are in most essential points parallel. In the Michipicoten district the basement rock is a greenstone, showing the ellipsoidal structure on the great scale so characteristic to the Ely greenstone of the Vermillion district. Also with this green stone are various other mashed igneous rocks, including porphyries. The iron-bearing formation in many essential respects resembles that of the Vermillion district. It contains substantially all the varieties of material in the iron formation of the Vermillion district, and in addition great quantities of pyritic quartz rock. On the bluff back of the Helen mine and at many other places iron carbonate is abundant. Near the Helen mine Mr. Merriam reports this carbonate as containing 19 to 37 per cent. of metallic iron. At the present time the iron formation has been developed only at the Helen mine. Here a good body of high grade hematite has been shown by stripping to extend in considerable areas to the rock surface. In 1900, the first year of shipment, 62,000 tons were shipped."



# THE DOMINION IR



PANORAMIC VIEW OF TH

It would be well during the next few years to keep one's eyes fixed upon the north; for assuredly that is where the great industrial development is going to be. While this is primarily a sketch of the Dominion Iron & Steel Co. of Sydney, N. S., the opening paragraphs will be devoted to the reasoning of its vice-president and general manager, Mr. Arthur J. Moxham, as to why its position for steel making is so strategically important.

"Reduced to its final analysis," says Mr. Moxham, "steel is a product resulting from the application of man's labor to three raw materials—ore, coal and limestone. These three ingredients by means of a blast furnace are converted into pig metal and this in turn by means of the open-hearth furnace into steel. It is therefore a fact, broadly speaking, that the cost of the finished steel varies with that of the pig metal and we need deal with this alone. Dividing the cost of pig metal between material and labor, the former is the variable, the latter, the constant. When the lake district was brought into prominent notice as the most economical point in the central west for making pig iron, Mr. Carnegie built his own railroad, known as the Pittsburgh Bessemer road, 155 miles long, connecting Lake Erie with Pittsburgh, and it was announced that this had made Pittsburgh a lake port. It always seemed to me that the 155 miles were still there. It is therefore, to a study of distance between materials that we must turn when investigating the advantages of any given location. In a nutshell, it is entirely a matter of freight.

"The cheapest steel centers in the world today are the following: In England the Middlesboro district; in Germany the Luxembourg district; in the United States the central west and Alabama districts. Of these districts the one which overshadows the others is that of the central west, of which Pittsburgh may be taken as the exponent. We will base our comparison on this, and so doing will be on safe ground. So what is the freight cost of assembling the raw materials in Pittsburgh? Please note we purpose taking actual costs, not market rates. It must be remembered that the haul is partly water, partly rail. It is well to find an equation between the two, and preferably to do so in terms of the rail freight. The actual cost of the lake haul of about 1,000 miles is in the neighborhood of 50 cents per ton, or say five one-hundredths of a cent a mile. The actual cost of the railroad haul can be safely taken at four-tenths of a cent per ton per mile. We will therefore treat 1,000 miles of lake water carriage as equal to 125 miles of railroad carriage. Of necessity this is only approximate, for water freight varies largely with distance. The heaviest item in water freight is the lay time of the steamers when loading and unloading. This will be realized when I make the statement that during the open or operating season a lake boat is in port about 50 per cent. of her time while operating on an average route 1,000 miles long. And this in a district noted for having every improvement for quick loading and unloading. If the route be a short one the percentage of lay time and consequently the cost of the freight per ton mile must largely increase. With these deductions Pittsburgh pays the following freight costs in the assemblage of raw materials:

"Ore—From mines to upper lake port, 80 miles railroad freight. From upper to lower lake port, 1,000 miles water freight, equal to 125 miles railroad freight. From lower lake ports to works, 155 miles railroad freight, making a total of one ton of ore of 360 railroad miles. It takes 1.70 tons of 60 per cent. ore to make a ton of pig metal. Therefore the latter calls for a total of 612 railroad ton miles.

"Coal—From Connellsville district to Pittsburgh, say 80 railroad miles. Taking the same quantity of coal, which is the amount that is used, 1.70 tons, gives 136 railroad ton miles.

"Limestone—From the Tyrone district, 130 miles. Say one-half ton limestone per ton of pig equals 65 railroad ton miles. Adding these together we have: Ore, 612 ton miles; coal, 136 ton miles; limestone,

65 ton miles; total, 813 ton miles. At four-tenths of a cent gives a freight cost of \$3.25 per ton of pig iron made. Remember again, this is freight cost, not the freight charged.

"In Bell island in Newfoundland there exists the now well-known Wabana ore. The economical point of its manufacture is at Sydney, directly on the cove beds. The cost of assembly is as follows: Coal, nothing. Ore, 402 miles sea freight. Owing to the relatively short distance the lake basis will not apply, as lay time in proportion to sea time will be the heavier. The actual cost will be 40 cents per ton. Limestone 15 cents per ton. We then have 1.8 tons of 54 per cent. ore at 40 cents, 72 cents; one-half ton limestone, 7½ cents; coal, nothing; total, 79½ cents. Let me say while passing that this is the lowest assemblage cost in the world for the tonnage under consideration. As against the Pittsburgh cost it represents a saving of \$2.45½ per ton."

Mr. Moxham does not stop in his comparison of costs at this point. He touches upon the costs in reaching the market with the finished steel and says:

"To compete for the export business Pittsburgh must get to tide water. She is now 500 miles from this, and it will cost her \$2 to get there. In dealing with the finished steel it must also be remembered that it takes about 1.1 tons of pig to make the steel. So taking 1.1 tons at \$3.25, we have \$3.57, to which add \$2 freight on steel to seaboard and we have \$5.57, from which deduct Sydney's assemblage cost, 79½ cents, and there is left \$4.78 as the net advantage in the cost basis. In actual practice this means more. We should further note that Sydney's tide water will average about 1,000 miles nearer to the world's market than that of Pittsburgh. In all conservatism it would be safe to call the commercial difference all of \$6 per ton. In a word, Canada's position as a steel maker is something more than strong. It is simply invulnerable."

## THE DOMINION IRON AND STEEL CO.

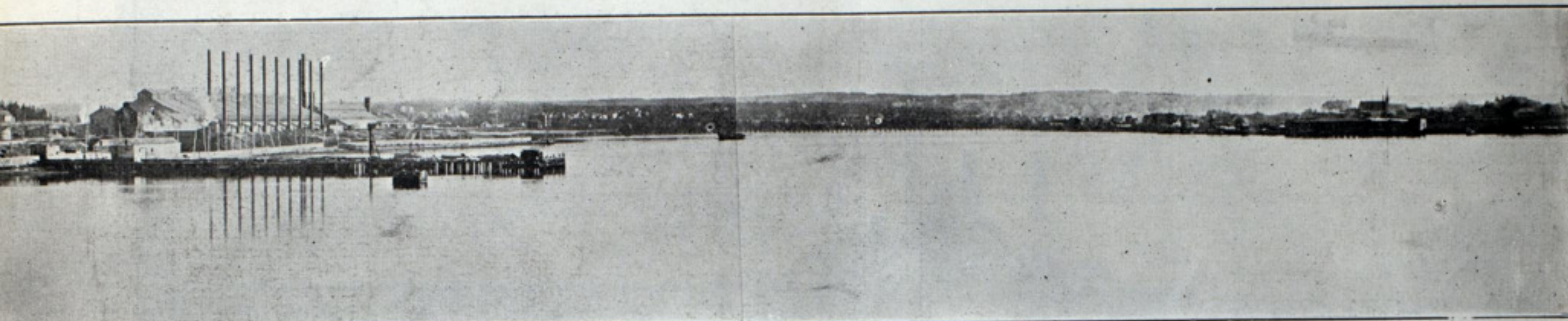
Now for the Dominion Iron & Steel Co. It has an authorized capital stock of \$15,000,000. The company has acquired by purchase iron ore property on Great Bell island in Conception bay, Newfoundland, about 35 miles from St. John's. This island, which is about 8 miles long and 2 miles wide, has exposed on the cliffs of its northern side five beds of ore, of which three, however, extend over so small an area and are so thin that they are of little commercial value. The two others are known as the upper and lower beds and constitute the Wabana mine. The lower bed was purchased by the Dominion Iron & Steel Co. from the Nova Scotia Steel Co., who still control the upper bed. A shipping pier has been built on the southern side where there is a very good harbor with a depth varying from 48 ft. to 84 ft. The dock has ten pockets of 200 tons capacity, each at a height sufficient to discharge into a steamer by gravity. The harbor is located about 425 miles from the works at Sydney. This ore has been mined since Dec., 1895. About 6,000 tons of ore can now be mined per day. It is estimated that the cost of mining and loading on vessels for some years to come will not be over 50 cents per long ton, and that at no time should the cost exceed from 80 cents to \$1. It can be freighted to Sydney at a cost of from 35 cents in ordinary times to 45 cents on the higher basis of recent times. The ore, therefore, will not cost more than 85 cents as a minimum to \$1.45 per ton as a maximum, delivered in Sydney. Mr. Moxham regards \$1.10 per ton as a safe average, all told. The ore runs about 54 per cent. in iron. It is estimated that the mine contains about 25,000,000 tons above sea level with a much larger quantity in the lower levels. Besides the Wabana deposit the Dominion Iron & Steel Co. owns an iron mine in the Santiago district of Cuba.

The Dominion Iron & Steel Co. has the option of leasing the Dominion Coal Co., including all its mines, and the Sydney & Louisbourg railway, on condition of paying the fixed charges and 6 per cent annually on the common stock. The reserves of fuel in the Sydney field are enormous, it being estimated that the Dominion Coal Co. controls areas which can be counted on to deliver over 2,500,000,000 tons of coal. This fuel is bituminous. As for the quality of the coke, that has been thoroughly determined by its use in the blast furnace. It is estimated that



# IRON & STEEL COMPANY.

## A Great Industrial Enterprise at Sidney, N. S.



WORKS AND SYDNEY.

the coal can be mined, washed and delivered at the furnace at a price not to exceed \$1.25 per ton.

The Marble Mountain limestone quarries are located at Clark's cove on West bay of the Great Bras d'Or lakes. The quarry is at an elevation of about 300 ft. above the level of the lake, and the deposit, which is a true marble, is of especially good quality. From the quarry the stone is lowered to a crusher by a double-skip car system with drum at top, the loaded car hoisting the empty. The crushed stone is fed by gravity to a 24-in. conveying belt, which carries it to an open bin at the foot of the mountain. Underneath the bin's chutes there is arranged a 36-in. conveying belt, of a capacity of about 600 tons per hour, which carries the crushed stone to an incline belt leading directly to the loading pier. This also has a capacity of 600 tons per hour and the barges or vessels for transportation can be loaded in three to five hours. In addition to the excellent marble quarry the company has developed a dolomite quarry at St. George's river, about 14 miles from the works at Sydney. This quarry has a capacity of about 1,200 tons per day.

The bounties on the manufacture of iron and steel granted by Canada are as follows:

	On pig iron—		
	from native ore.	from foreign ore.	On steel.
To April 21, 1902.....	\$3.00	\$2.00	\$3.00
April 21, 1902, to July 1, 1903.....	2.70	1.80	2.70
July 1, 1903, to July 1, 1904.....	2.25	1.50	2.25
July 1, 1904, to July 1, 1905.....	1.65	1.10	1.65
July 1, 1905, to July 1, 1906.....	1.05	.70	1.05
July 1, 1906, to July 1, 1907.....	.60	.40	.60

When it is considered that the present plant, as laid out, has an annual capacity of 250,000 tons of steel and of 150,000 tons of pig iron for the open market, the magnitude of these figures will be apparent. The company is also free from local taxes of the county of Cape Breton for thirty years.

### A GREAT NATURAL HARBOR AT SYDNEY.

The mines are located in the harbor of Sydney, the town having donated to the company about 500 acres of land within the town. So far as the harbor is concerned the impression that Sydney is in the polar regions is far from the truth. Taking the government reports from 1880 to 1899, they show that the earliest closing of Sydney harbor by ice was in 1880, on Dec. 31, opening in 1881 on April 29; so that then it was closed four months. As a context to this the other periods of closing are as follows: 1892, harbor closed sixteen days; 1894, twenty-five days; 1895, six days; 1896, ten days; 1897, fourteen days; 1898, thirty days. An average for the whole nineteen years shows that the harbor was closed Feb. 3 and opened March 14. The average closing of the harbor, therefore, is covered by thirty-nine days. In 1900 the harbor was open the whole winter. In this respect, therefore, Sydney is better off than the lakes, upon which the American steel industry depends. The winter shipping point of the Dominion Iron & Steel Co. will be the port of Louisburg, which is open all the year round. It is about 22 miles distant as a crow flies from the works and is connected with them by the Sydney & Louisburg railway, something over 40 miles long.

### DESCRIPTION OF THE STEEL PLANT.

The works proper, to which these outside developments are tributary, consist in general of a plant of four blast furnaces, ten 50-ton open hearth furnaces, a 35-in. blooming mill and pit furnaces, 400 Otto-Hoffman coke ovens, coal washing and sulphuric plants and essential by-product plant, and a large machine shop and foundry capable of taking care of all mill and furnace work. In connection with these works there is about 20 miles of railroad track, full ore handling equipment, receiving and shipping piers, and all the necessary attributes to a well equipped modern plant. The company owns a tract of real estate, on which they have erected a number of houses of a better class. These houses are neat in design and equipped with all modern improvements.

The fresh water supply for the works is obtained from Sydney river, which is about 5 miles from the location of the works. A dam and

pumping station have been constructed on this river for separating the fresh from the salt water, and the drainage from an area of 65 square miles is available for service. The dam is about 240 ft. long and has a depth of 20 ft. at the center of the stream. It is constructed of cribbing filled with stone; the salt water side is planked with creosoted timber, the fresh water side is sealed by means of a puddle face and gravel slope. The dam is provided with fishway and the company have constructed a lock which will allow a boat 20 ft. wide, 6 ft. draught at low water, and 50 ft. long, to pass through during the open season of navigation.

The pumping station is constructed of brick and is equipped with two horizontal tubular boilers of capacity of about 110 H. P. each. These are strongly built and especially designed for a working pressure of 150 lbs. per square inch, built by T. A. McLean, Charlottetown, P. E. I. The pumps were manufactured by the Worthington company of Brooklyn, N. Y., and are two in number, of a capacity of 3,000,000 gallons each per twenty-four hours, the estimated requirements of the works for fresh water being about 3,000,000 gallons per day. The pumps are duplex, direct-connected triple-expansion condensing, with high-pressure cylinder 12 in. in diameter, the intermediate cylinder 19 in. in diameter, the low-pressure cylinder 30 in. in diameter, the plunger 16 in. in diameter—all with 24 in. stroke. The pump house is provided with a large well, to which the water is admitted through intake pipe, constructed of cypress wood, leading from a crib provided with screens, and located at the center of the river. This supply is abundant and the water of an excellent quality; about 600 ft. of the main line is of 36-in. pipe and the balance to the works along the roadway and through the company's property is 24 in. in diameter. All the iron is the bell and spigot pipe of the ordinary water works specifications. Connections have been provided for the town of Sydney and other consumers, in case of additional water supply being required. On the water main inside the works is located a standpipe 20 ft. in diameter, 85 ft. high. Salt water will be used for blast furnace circulating system.

### MACHINERY FOR ORE HANDLING.

The ore handling plant consists of a pier upon which are located four hoisting machines or towers of a type similar to those used on the Montreal docks for handling coal. These towers have given very satisfactory results, and are a quick machine for the handling of all heavy materials. The capacity of each tower is 1,200 to 1,500 tons per twenty-four hours. These are designed and built by the Dominion Bridge Co. of Montreal. The machines are mounted on trestle work above a superstructure, upon which is provided a double-track system for handling of cars. Ore is unloaded directly from the boats to shallow bins or hoppers, which form part of the mechanism and the ore is delivered through these to hopper bottom cars. The above mentioned track trestle work leads from the pier about 1,100 ft. to the ore bins, which are provided with three tracks with suitable cross-overs for the handling of coke, ore and limestone for the regular furnace supply and for storage in the stockyard. The stockyard is provided with three Brown Hoisting Machinery Co.'s traveling machines. These three machines have ample capacity for taking care of the storage of six months' supply of material as well as for rehandling of stock for the winter operation of the blast furnaces. The stockyard, which is commanded by three Brown machines, has an effective width of 366 ft. and is 952 ft. long with tracks for an extension of 150 ft., making the available length of the cross section 1,100 ft. This yard is of a capacity sufficient to take care of six months' supply of ore and limestone for four blast furnaces. The ore is brought in from the pier upon which the unloading machines are located in the before described manner and transported to the top of the bins, from whence it is dropped into the stock or storage bin, the former delivering its supply to a motor-driven scale car underneath, which transfers the stock to the skip cars, or the latter, which delivers the stock to transfer cars, upon which are placed two 3-ton buckets, which are handled by the Brown machine, the stock being lifted and deposited in the yard for winter use. In the winter season the Brown machines with scoop buckets gather material from the stock pile and deposit it into the stock bins or into drop bottom cars, from which the material is transferred to the



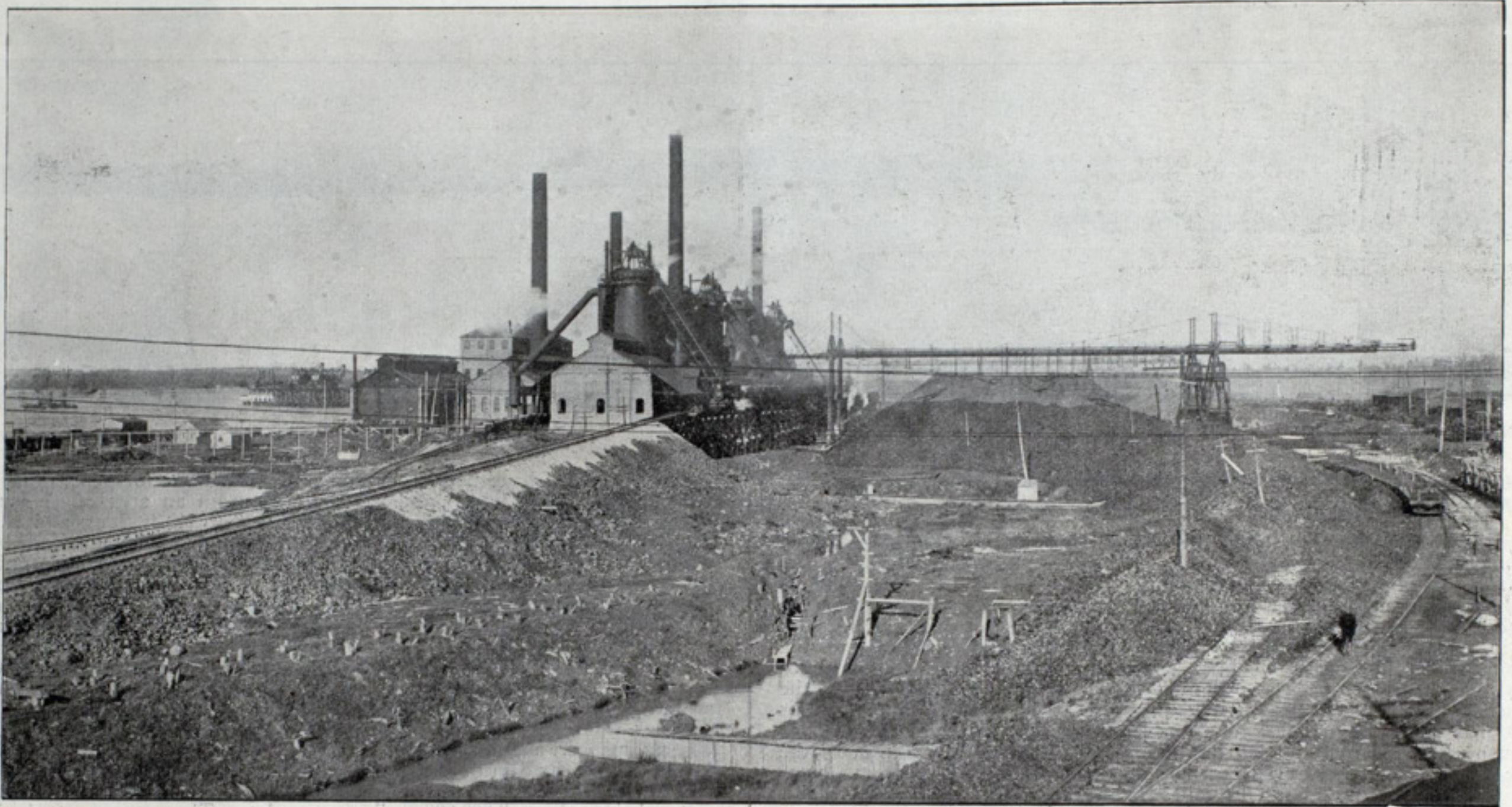
supply bins, from whence it is taken to the furnaces by the scale cars. The bins for storage are all of the same cross section and are fifty-six in number. There are four large coke bins over the center of each skip pit, in which the coke is fed directly into the skip car which takes it to the furnace. There are twenty-eight bins for use for ore or limestone, being seven for each furnace. The Brown machines are independent motor driven, the span of the bridge being 225 ft. and the cantilever 105 ft. The back leg of the machine is mounted on rails 16 ft. from center to center. The motors are located on the truck of the back leg of the machine and are enclosed in a suitable engine house. The operators' house is located directly above and on the side of the leg of the machine.

#### THE FURNACE EQUIPMENT.

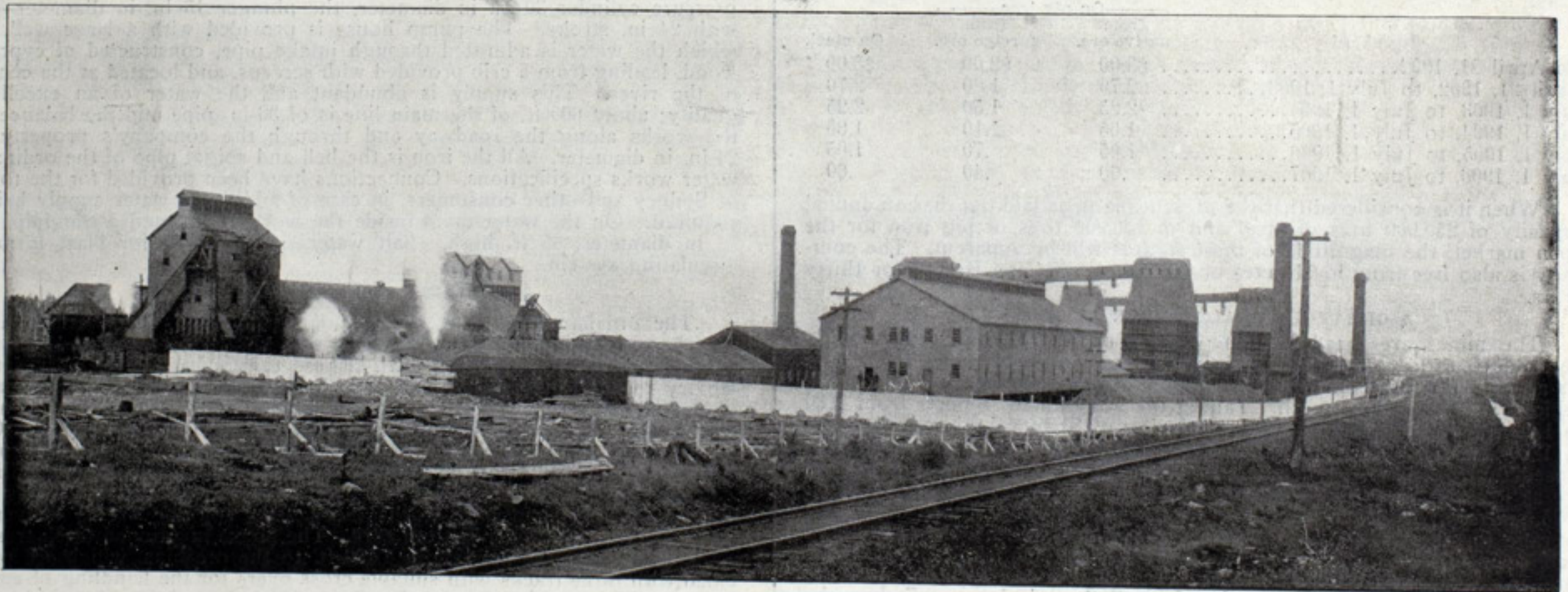
There are four furnaces, built and erected under contract with the Riter-Conley Mfg. Co. of Pittsburg. The furnace stacks are 20 ft. in

These stacks are of steel, 11 ft. diameter inside the lining, and 200 ft. high. The boilers are connected to these stacks by overhead breeching. They are of the Babcock & Wilcox type, amply strong for working pressure of 150 lbs. to the square inch. The engine house is 44 ft. 2 in. span and 200 ft. long. It contains five pairs of blowing engines, built by the E. P. Allis Co. and commanded by one 30-ton electric overhead traveling crane. These engines each have a high-pressure cylinder 50 in. in diameter, a low-pressure cylinder 96 in. in diameter, with a blowing tub 96 in. in diameter, all of 60-in. stroke.

The pump house, which is a lean-to on the engine house, is of 30 ft. span, 200 ft. long, and contains three horizontal Wilson-Snyder compound direct-connected circulating pumps, having steam cylinders 18 and 32 in. in diameter. The bronze plungers are 24 in. in diameter by 36 in. stroke. The pumps are each rated at 6,000,000 gallons per twenty-four hours. All pumps are connected to an exhaust line extending to the end of the



VIEW OF STOCK PILES AND BLAST FURNACE.



COAL WASHER AND COKE OVEN PLANT.

diameter at the bosh and 85 ft. high. The diameter of the hearth is 11 ft. 9 in.; at stock line it is 14 ft. 6 in. and there are twelve 6-in. tuyeres. Each furnace is provided with Julian Kennedy's patent top filling apparatus. The furnace shell is 28 ft. in diameter at the mantle and 23 ft. at the top of the furnace. The bustle pipe surrounding the columns is 46 ft. in diameter. The tuyere stacks, twelve in number, are of an improved type with ball joints and adjustable blow pipes. The skip-hoist leading from under the stock bins to the top of the furnace is of structural steel and carries two skip cars which rest at the bottom in a steel cased pit. The stoves are of the Cowper type with a casing 21 ft. in diameter by 85 ft. high. The stove chimneys are 9 ft. in diameter inside the lining, are 200 ft. high and are provided with heavy cast iron bases and are bolted at the fountain.

The boiler house is 53 ft. wide and 576 ft. long. It is a steel building with brick walls and heavy concrete foundations. It contains 8,000 H. P. of boilers, with two steel stacks, one for each 4,000 H. P. of boilers,

engine house, with connections leading to the condenser system. Provision is made for the connection of a fourth pump if desired. These pumps obtain their water from the harbor, and will be connected to a 20x85-ft. standpipe, which will supply water for circulating and cooling purposes. The pump house contains a pair of surface condensers built by the Borthey Mfg. Co. of Toronto. Through these the return water from the furnaces will be used for condensing purposes. The fresh water supply line leads to the wall of the engine house and has connection to the boiler feed pumps, which are three in number and are duplex, of outside packed plunger type, 14x9x18 in. stroke. These were built by Wilson-Snyder Mfg. Co., Pittsburg. A valve is placed on the fresh water line for connection to the main salt water well and to the salt water discharge line from the pumps, enabling the use of fresh water in case of emergency for cooling purposes. To the Northey condensers in the pump house there is a connection leading through the wall to a line to the electric power station. This part of the equipment consists of



three 500-kw. electric generators built by the Canadian General Electric Co., and each driven by a cross-compound condensing engine with cylinders 20x40 in. in diameter, 42 in. stroke, running at a speed of ninety revolutions. They were built by Laurie & Co. of Montreal. The building which has 51 ft. 3 in. span by 130 ft. long, is of steel with brick wall filling. The structural work was furnished by the Dominion Bridge Co. of Montreal. The electric machinery is commanded by a 15-ton crane, also designed and built by the Dominion Bridge Co. The switchboards, booster and electric appliances are all of the latest type, and the entire equipment of the electric power station was furnished by Canadian manufacturers.

The metal from the furnaces is taken in 25-ton ladle cars to a motor driven pig casting machine, which was built by the Heyl-Patterson Co., Pittsburg, and which has a capacity of 1,600 tons per twenty-four hours, or hot metal may be taken direct to the open-hearth furnaces.

#### OPEN-HEARTH FURNACE PLANT—BLOOMING MILL.

There are ten 50-ton open-hearth steel furnaces. They are of the tilting type, and the Bertrand Thiel process may be used. These are arranged in a continuous row, and metal may be put into the furnace from either side, or cold pig or stock may be placed in the furnaces by two Wellman-Seaver charging machines. The product of the furnaces, which is estimated at 1,400 tons per day, will be tapped into 50-ton ladles, from which it is poured into the molds on cars and transferred to the stripper building to be deposited in the pit furnaces. The open-hearth building has a span of 65 ft. with a lean-to 37 ft. wide, and is 832 ft. long. The gas for the open-hearth furnaces will be obtained partly from producers of

Whitney, late president of the company, at Everett, Mass. The plant consists of two rows of four batteries each consisting of fifty ovens each, or a total of 400 ovens. These are of the Otto-Hoffman by-product type, and the capacity is rated at 1,600 tons of coke per day. There is the necessary mechanism for the charging of coal and the pushing of coke from the ovens to a quenching floor or loading platform. These ovens are of the latest type and embody a number of changes in detail, from which the Dominion Iron & Steel Co. receives the benefit of experience of former plants of this type. In addition to eight batteries they are provided with a condenser house 60 x 100 ft., with a cistern adjoining of 40 x 150 ft., and the necessary coolers, sieve washers, etc., for cooling and cleansing the gas. There is also a boiler house containing 1,500 H.P. of Babcock & Wilcox water-tube boilers, inclosed in a brick building 50 x 100 ft. Adjacent to this is the ammonia house, 40 ft. span by 106 ft. long, with an adequate storing space.

Adjacent to the coke oven plant is the coal washing apparatus, which is inclosed in a building 50 x 150 ft., and is provided with the necessary raw coal bins, crushers, and washed coal bins for delivery to the ovens. The machinery and plant are practically of the design made by Stein & Boericke of Primus, Pa., who have successfully washed by the jig system coal of the class which is furnished by the Dominion Coal Co. The capacity of the plant will be 2,400 tons per day.

The sulphuric acid plant was designed under the supervision of Chas. A. Bartsch, consulting chemist, of Philadelphia, and has a capacity of 40 tons of acid per day. It is equipped with the latest improved apparatus and is a modification of the old chamber system. Pyrites will be used in the manufacture of this sulphuric acid, an adequate supply of which



DOMINION COAL CO.'S PIERS.

the latest improved type and partially from the coke ovens. A 1,000,000 cu. ft. triple lift gas holder is so constructed as to give a working pressure of 5-in. column of water.

The blooming mill has a 35-in. train, which was built by the Mackintosh-Hemphill Co. of Pittsburg. It is direct-driven by a pair of 50x60-in. reversing engines of their latest design. The mill is commanded by two 20-ton electric overhead traveling cranes, built by the Brown Hoisting Machinery Co., to be used also for charging or drawing ingots from pit furnaces. The mill and pit furnace building is 81 ft. 10 1/4 in. wide, 480 ft. long, and contains sixteen pit furnaces of the latest type, also the necessary approach tables, main tables, hydraulic and steam shears.

The blooming mill boiler house is 46 ft. span, 296 ft. long, and contains 3,000 H.P. of Babcock & Wilcox boilers. One section of the boiler house contains three hydraulic pressure pumps, which are 18 and 32x8x36 ft., of the compound duplex type, furnished by the Northey Mfg. Co. of Toronto. The hydraulic system will be of the return type and designed for a working pressure of 500 lbs. to the square inch, with suitable accumulators and operating valves. The boiler feed pumps are compound duplex type, also made by the Northey Mfg. Co., Toronto, being 8 and 14x7x18 ft. stroke. Suitable heaters will be provided. The boiler house building is of steel with brick walls and the same general construction as the other steel work buildings—size 46 ft. span by 296 ft. long.

In connection with the open-hearth plant there is a calcining, grinding and mixing plant of capacity sufficient to furnish all refractory material, linings, etc. This plant is equipped with the usual mixers, crushers, elevators, bins and calcining cupolas. The building is of steel with brick wall filling.

It is contemplated to discharge a large quantity of tar on one side of the No. 2 pier. The tar will be brought in tank cars from the coke oven plant to storage tanks and pumped into tank steamers.

#### COKE OVEN PLANT AND OTHER PARTS OF THE WORKS.

The coke oven plant, erected by the United Coke & Gas Co., is in general a duplicate of the works which were erected for H. M.

will come from the pyrites mines at Newfoundland. The plant is arranged for economical handling, and the sulphuric acid will be transferred from the storage chambers to the ammonia house in a tank car.

The machine shop is 52 ft. span with a 20-ft. lean-to on each side and 256 ft. long, with a fire wall at the end. There is a cleaning room, of same cross section as the main building, between the machine shop and foundry. The shops are equipped with large and small lathes, planers and improved working tools for the handling of all mill and furnace work. At one end of the machine shop is located a locomotive pit. The machine shop erecting floor is commanded by a 25-ton electric traveling crane built by the Niles Tool Works. The foundry is the same cross section, 192 ft. long, and contains two cupolas of capacity about 20 tons per hour. A three-pit brass foundry and the necessary blowers, hoists and equipment for mill and foundry are provided for serving the floor. There are two electric overhead traveling cranes; one, 25-ton was built by the Niles Tool Works, and one of the same capacity with auxiliary hoist was built by the Dominion Bridge Co., Montreal. The boiler room contains an air compressor for furnishing power to the chipping and hoisting tools, and two boilers, 125 H.P. each. These are the Babcock & Wilcox water-tube type. The electric station furnished power for lighting purposes during erection work and for the electric cranes through the works during construction. The blacksmith shop is equipped with bolt header, steam hammer and ordinary tools. The building covering this part of the outfit is 52 ft. 4 in. span and 192 ft. long. The pattern shop and carpenter shop are fitted with full set of working tools, and in one corner of the pattern shop is located the tin shop equipment. This building is 52 ft. 4 in. span by 192 ft. long. A warehouse is located adjacent to the shop location and is 60 ft. 8 in. span by 217 ft. long.

Asked regarding the market for Sydney steel Mr. Moxham replied: "Situated on the seaboard the whole world is her market, all of it, and in our modesty we do not ask for more."

A chart of Lake Erie in colors (engineer survey) has just been issued and may be had from the Marine Review.



## LONDON DOCK CHARGES.

BY AMBASSADOR JOSEPH H. CHOATE.

At the request for information of a Minnesota milling company a department instruction was sent to Ambassador Choate of London April 15, 1901, directing him to investigate the dock charges there. The complaint of the company was "that although the port of London is made a free port by act of parliament the London and India dock companies evade the requirements of law, to the special detriment of certain American goods, in exacting dock rates from flour and other products exported from the United States." The ambassador's reply is as follows:

I have examined the matter, as far as I could, without any power to compel the production of evidence, by the aid of voluntary statements of parties more or less interested in the question and by reference to judicial decisions and to acts of parliament bearing upon it. I have not, however, undertaken to form anything like a judicial opinion as to the merits of the question involved, but have thought that I should best serve the purpose by setting forth the facts as I understand them and the claims of the respective parties. It can not fairly be said that the "dock companies evade the requirements of law to the detriment of American goods in exacting 'dock charges' from flour or other products exported from the United States." As the business is now done, the dock companies really have nothing to do with it. The question in dispute or sought to be raised by the Minnesota mill owners is now controlled by contract between them and the steamship companies. As long as that contract stands, there can be no remedy for their alleged grievance, which to that extent is self-imposed. What the shippers insist upon is that they are unjustly compelled by the steamship companies to make this contract and that the result is unfair to them; that the North Atlantic steamship lines running ships to London have combined and inserted an identical "London clause" in their bills of lading, compelling the payment of these dock charges in addition to freight; that this combination is too strong for them; that unless they accept the bill of lading with this obnoxious clause in it their flour must remain unshipped; that a resort to occasional tramp steamers, some of which also insert the London clause, would be wholly inadequate; and that under present conditions the establishment of a rival line which would omit this extra charge from its bills of lading is out of the question; that they have protested against this charge in addition to freight, but have been obliged to submit.

If an unjust exaction has by such means been inflicted upon the shippers, it can hardly be doubted that congress is competent to provide a remedy even against such a powerful combination of all the existing steamship lines. The ultimate question must be whether the "dock charges" imposed by the "London clause" are really unjust to the shippers, and on that question an acquiescence of twelve years by the shippers without forcing it upon the attention of the government has a decided bearing. What is meant by saying that London is made a free port by act of parliament is a conclusion drawn from the history of the matter in connection with certain provisions of the acts creating the dock companies, and of the merchants' shipping act, there being of course no provision in set terms that London is or shall be a free port.

Prior to the formation of docks in London about a century ago, the usual mode of discharging cargo was overside into barges or lighters in midstream, the barges carrying it to the wharves and quays. The formation of docks was stoutly opposed by the powerful association of bargemen or watermen, and to save their rights and the powerful interest represented by their business, which was of great antiquity, a clause was inserted in the original and in each succeeding dock charter in substance exempting all lighters and craft entering the docks to discharge or receive goods to or from any vessel from the payment of any rates, and that the goods so discharged or received should be exempt from any payment whatever, and so the law now stands. This secured to the bargemen and to the owners of cargo the ancient right to the loading and discharge of cargo overside, even in the docks, without any charge by the dock companies, and as by the established law of shipping the freight paid to the ship always covered the discharge and delivery of cargo, unless the parties otherwise agreed, no charge could fall on the goods beyond or outside of the freight for their unloading and delivery. In harmony with these enactments, which thus secured to the bargemen and to the cargo exemption from dock charges for unloading, it was and still is, unless otherwise agreed, the custom of the port of London that a consignee of goods has the right to the delivery of his goods overside and therefore free from landing charges, if he is ready and willing to take delivery of the same within twenty-four hours after the arrival at her place of discharge of the vessel in which the goods are borne. This, I take it, is what is meant—and all that is meant—by London being a free port.

While such was the custom of the port, if for his own convenience the ship owner discharged the cargo or any part of it on the dock quay, the dock owners had the right to levy a charge upon it, and this charge, so far as I can learn, in the absence of any agreement to the contrary with the owner of cargo, has uniformly been paid by the ship owner, who, for his own convenience, preferred to discharge it there, instead of overside. Overside delivery into barges involved the sorting of the cargo on the deck of the vessel, and so long as trade was carried in sailing vessels and even after the introduction of steamships, so long as they were of moderate size and carried cargo to a comparatively small number of consignees, the delay in delivery thereby involved was not serious.

But with the introduction of the enormous steam carriers of merchandise now in use, the old mode of discharge overside became extremely difficult; to sort on deck for a large number of consignees a great variety of merchandise involved great delay in the delivery of cargo, and all unnecessary time spent in the dock was extremely costly to the ship owner, owing to the enormous amounts invested in the steamships, which necessitated each one making as many voyages as possible in the course of a year or other given period. To prevent unnecessary detention in the port or in dock, the ship owners appear to have made arrangements with the dock companies (who up to 1890 claimed and exercised the right to discharge all vessels that came into their docks, when this was not done by the crews) to take charge of the whole cargo on the quay, and there to sort it and to deliver it from the quay to lighters, if for water carriage. The owners of these great steamers found it cheaper to pay themselves the cost of the use of the quay and the labor thus done by the dock owners in the delivery of the cargo to barges than to incur

the loss consequent upon long detention of their valuable steamers while discharging overside. Of course, there is a mutual convenience and advantage as between ship and cargo in the quick discharge of the latter; but it is claimed by the merchants that from causes over which they have no control, in the arrangements in the docks, there is no considerable benefit accruing to them in the way of quick delivery—that the goods come out of the ship fast enough, but do not reach their hands any earlier than they would if discharged overside.

There is a clause in the merchants' shipping act that "if any goods are, for the purpose of convenience in assorting the same, landed at the wharf where the ship is discharged," the same being ready to take delivery and carry them elsewhere, "the goods shall be assorted at landing, and shall, if demanded, be delivered to the owner thereof within twenty-four hours after assortment; and the expense of and consequent on that landing and assortment shall be borne by the ship owner." In view of the enactments already cited, securing the right of free discharge overside into barges and of the custom of the port already referred to, there seemed to be no possible way, except by the express consent of the owners of cargo, to throw upon the cargo the whole or any part of the extra cost resulting from landing on the quay and of the work done in assorting the goods there and delivering them to the barges sent by the owners.

We accordingly find that until the introduction of the London clause into the bills of lading of the North Atlantic lines running to London, in April, 1888, and since then in all other trade, all such expenses in that port have been paid by the ship owner. It comes out of the freight, as all expense of discharge and delivery has always done. For a considerable period prior to the introduction into the bills of lading of the London clause, the steamship companies discharging cargo on the dock quays (including the North Atlantic lines) had been paying the dock companies for flour at the rate of 10d. (20 cents) per ton, which they bore themselves without any attempt, so far as I have been able to learn, to put the whole or any part of it upon the owners of cargo. Probably, this extra expense incident to landing on the dock and delivery from thence, instead of an overside delivery, was not at first considerable; but when it reached this point of 10d. per ton the North Atlantic lines concluded that it took too much out of the current freight, and that they could not afford to do the business any longer unless the owners of cargo should consent to the shifting of this expense upon themselves. Accordingly, they combined to insert the so-called London clause in all their bills to London.

This clause entitled "London clause" provided, as first framed, that "the ship owners shall be entitled to land these goods on the quays of the dock where the steamer discharges immediately on her arrival, and upon the goods being so landed the ship owners' responsibility shall cease. Note as to delivery into lighters—Consignees desirous of conveying their goods elsewhere shall, on making application to the dock company within seventy-two hours after the steamer's report" (this was instead of twenty-four hours, as previously), "be entitled to delivery into lighters at the following low rates: . . . Flour, 1s. 2d. (28.3 cents)."

From time to time this clause has been amplified, but the only essential changes for our present purpose are that, beginning with 1s. 2d. in 1888, the dock charge has been successively increased on flour to 1s. 6d. (36.3 cents) and to 1s. 9d. (42.3 cents), the present rate. Since its adoption the bill of lading, including the London clause, has been the contract of the parties. In 1891, after the rate of this dock charge on flour had been advanced to 1s. 6d. per ton, Borrowman, Phillips & Co., London merchants, consignees of flour under one of these bills of lading, wishing to contest it, brought suit against the Wilson line in the high court of justice, queen's bench division, to recover the 1s. 6d. paid under protest, after an offer to take the goods overside by lighter. The case was tried before two eminent judges, Mr. Justice Day and Mr. Justice Lawrence, and judgment was given against the plaintiff. In the opinion of the court, delivered by Mr. Justice Day, it was held that although there was no doubt that by the custom of the port of London the owner of goods is entitled, if he makes application within twenty-four hours, to have his goods delivered into lighters, yet this right was subject to special agreement, and here the parties had otherwise agreed. In answer to the claim of the same right by statute, he said: "If you can contract yourself out of the common law—that is, customary right—so also you can contract yourself out of the statute law;" and he held that the plaintiffs had done so, and that it was perfectly clear that the plaintiffs could not recover. The cause was heard on a special case, in which it was stated by agreement of counsel that the London clause was introduced in April, 1888, in pursuance of an arrangement made at a meeting of ship owners and merchants held in the city of London in December, 1887; that it is well known to shippers and consignees, and its object is to secure dispatch in discharging; that the plaintiffs had, prior to the voyage in question, had shipments of goods under bills of lading containing the same clause, but were not parties to the arrangement of 1887, or aware of, or represented at, that meeting, have always protested against the insertion of the clause in their bills of lading, and have always paid under protest the dock charge thereby required. The learned judge who gave the opinion of the court goes somewhat beyond the agreed statement when he says "the 'London clause' has been entered into, it is stated, by ship owners and merchants in London for the purpose of expediting business. It contains most reasonable provisions which are almost necessary for the conduct of commercial business in these times, and when one finds immense vessels coming into the port of London, it is ridiculous to have applicable to such vessels and to such cargoes the old custom of the port of London, which was no doubt very applicable to small vessels containing very limited cargoes indeed. . . . If the ship owner had entered into this contract for the purpose merely of pecuniary benefit, he would have been entitled to the benefit of the contract. It is quite clear, however, that it is not merely for pecuniary benefit, but that it is to the interest of all parties concerned that their goods should be delivered in the most convenient manner, and so as to enable them always to get their goods within the shortest possible time," and he describes the dock charges as "moderate terms."

The ship owners rely very strongly on this judgment and on the opinion as establishing their side of the case; but it will be noticed that



the only point decided was that the plaintiffs were bound by their contract, and that they had contracted themselves out of the right they claimed, and that beyond that the opinion is largely obiter. There was no evidence whatever, so far as I can see, of the moderateness or reasonableness of the charge, which is the most important point. Although it is stated by the special case and by the judge that the introduction of the London clause was in pursuance of an arrangement made at a meeting of ship owners and merchants held in London in December, 1887, this is stoutly denied by the merchants here, who insist that the only meeting ever held on the subject was a meeting of ship owners and consignees, not of cargoes but of ships, who were, of course, only the agents of the ship owners. I do not consider this latter question of great importance, as I think it is not claimed that American shippers, like the Minnesota mill owners, had anything to do with it. They make their bills of lading subject to all the conditions expressed in local bills of lading used by the steamship companies carrying the property at the time of shipment, and they have to take what is given them or let their goods go unshipped.

In the year 1890, after a very serious strike among the dock laborers, the dock companies declined to have anything more to do with cargoes discharged upon the docks for transfer to barges or to perform any labor thereon, which they had theretofore done under a claim of right, and since that time such labor has all been done by the steamship companies. Since 1891, the present system has been uniform. The steamship companies handle the goods from the time they leave the steamer's hold until they are delivered to the consignees' barges at the quay. In order to enable them to do this with convenience and dispatch, they hire by the year from the dock companies for an agreed rental—which is all that the dock companies receive, directly or indirectly, from the business—a certain extent of quay space, which may, for the purpose of the business of the discharge and delivery of the goods, be regarded as an enlargement of the deck of the steamer.

The 1s. 9d. charge which is the subject of the present contention is made, not for discharging the goods from the ship onto the quay, which is still borne by the steamship companies and is a heavy cost, but for the accommodation, shelter, and care of the goods upon the quay, and for all labor done upon them from the moment they touch the quay until they are delivered to the barges, including sorting, piling and removing. It is asserted by the merchants that the aggregate amount of the 1s. 9d. exacted for all this leaves to the ship owners a considerable profit after paying the rental of the dock space or sheds, and paying for all this labor. But, on the contrary, it is claimed by the ship owners—and they say they are ready to prove it by their books—that the 1s. 9d. does not nearly pay them for the actual cost of the rental of the quay and doing the labor. I have not been able to ascertain what the amount of the rental so paid is, except that I understand in a general way it is from a quarter to a third of the total cost, to cover which the 1s. 9d. is charged, but it includes the privilege—very valuable to the steamship company—of a preferential berth ready for each steamer on arrival. It was testified before the royal commission on the port of London during the present year by Mr. Charles J. C. Scott, the chairman of the London & India Docks Co.—the company which actually performed this work for the ship owners during the first two years of the "London clause"—that a considerable amount of profit accrued to the ship owners out of the 1s. 9d.; but on the other hand, we have the positive statement that there is no profit, but an actual loss, with an offer to verify this.

But behind this question, whether the present charge of 1s. 9d. fairly represents the actual cost to the ship owner of this substituted mode of discharge and delivery, over the cost of the old mode of overside delivery, lies the more important and vital question, whether in the changed conditions of commerce this charge should be borne by the ship or by the cargo, or should be apportioned between them according to the proportions of benefit received by them, respectively, from the new method of delivery. No reasonable man, I think, would claim that there should be a return to the antiquated mode of delivery overside. That would hardly be practicable. What the merchants claim is that the freight should pay the cost of discharge and delivery of the cargo, as it has done from time immemorial in the absence of special agreement; that if the freight is not sufficient to cover this, the freight should be enlarged, instead of imposing an extra landing charge, so that when the mill owner in Minnesota or the consignee in England sells the flour at a price based upon cost, insurance, and freight, both parties may understand exactly what they are doing. Under the present method of charge, this 1s. 9d. landing charge is not regarded as between buyers and sellers as part of the freight. As to discrimination, whatever discrimination there is, arising from the system of charge complained of, is not against the United States alone, but against the United States and Canada, the Canadian steamship lines having adopted the "London clause." There is undoubtedly a discrimination as against flour from the United States and Canada in favor of flour coming to London from all other parts of the world. Flour is brought to London from many other parts of the world and is landed and delivered from large steamers in much the same way, and whatever cost attaches to this mode of delivery is paid by the ship owners out of the freight, no such clause as the "London clause" having been adopted. But the amount of flour brought from all other parts combined is exceedingly small as compared with the vast shipments from the United States and Canada, and I have no means of ascertaining whether this cost of landing and delivery via the quay to the lighter is or is not compensated for in the freights charged by the steamers not belonging to the North Atlantic lines.

As to discrimination as the effect of this charge, between shipments to London and those to other parts of Great Britain, there is a still greater difficulty in arriving at any just conclusion, as this would involve a full and exhaustive study of the whole subject of freights, which I have no means at my command to make. It is certain that the North Atlantic lines running to London have not introduced a clause similar to the "London clause" in their bills of lading to any other parts in Great Britain; they make no charge for delivery of cargo in addition to freight, but they claim that London is a far more expensive port for the discharge and delivery of goods than any other, owing to the cost of labor, dock charges, necessity of dispatch, and other causes, and that in other ports delivery on the quay is a good delivery to the consignee.

Strong support for the "London clause" is sought by the ship owners from the fact that at Liverpool—by the ancient custom of the port, as they claim delivery onto the quay is a good delivery discharging the ship—the consignee of the cargo has to pay for the subsequent moving into

barges a charge on his goods, which is regulated by municipal ordinance, known as "master portage," and is claimed to be approximate in amount to the London clause charge for the similar service. It is even claimed that the "London clause" was initiated in order to assimilate the course of procedure in London to what was found to work well in Liverpool and other ports. In a certain sense, this may be so; but one must have an intimate knowledge of comparative freights, which is quite beyond my reach, to determine as to the sufficiency of the freights to the two places, from time to time ruling, to compensate the ship owner for what he has to do in handling the goods on arrival. The claim last alluded to is, perhaps, only another mode of stating the fact that when the charge of the dock companies for the new mode of delivery had reached 10d. per ton, the steamship owners concluded that the payment of this by them made too great an inroad on their freight, and that to avoid raising the freight, which might appear to result in an awkward discrimination between freight to London and those to Liverpool, they should transfer to the owner of the goods this extra charge, and not include it in the freight.

The notice issued by the combined steamship companies on Nov. 26, 1900, by which, from Jan. 1, 1901, the rate of dock charges on flour was raised from 1s. 6d. to 1s. 9d., well illustrates the method of which the shippers and importers complain. The entire body of North Atlantic lines running to London, without consulting the shippers and consignees from whom the extra charge is exacted or giving them a chance to be heard, issue a joint notice raising the rates. This increase is unrestrained by any possibility of competition, and is imposed by the mere will of one of the parties to the contract, upon the plea that the increase only represents a portion of the extra outgoings, and will, they think, under the circumstances, be considered reasonable; but if unreasonable, the shippers and consignees have no means of resisting it. There is no doubt that the London clause gives the consignees the extended time of seventy-two hours in which to tender their barges for receipt of cargo, instead of twenty-four hours allowed under the usual custom of the port. Under the old system, failure to present their barges within the twenty-four hours gave the ship owners the right to land and deliver cargo to the dock authorities, whereby heavy charges far exceeding the 1s. 9d. were incurred, which difference is in such cases saved to the owners of cargo who present their barges within the seventy-two hours. The ship owners insist that the advantages of the alteration of system are mutual, that they are able to charge and work at lower freight rates from their ability to turn their steamers round in the same time as that required at other ports (although it is to be noted that they do not point to any specific reduction of freight rates as occasioned by this change); and that the benefit to the cargo owner is that the greater dispatch in delivery saves him extra dock charges, depreciation, loss of interest, and demurrage of barges while waiting—very serious items, sometimes, under the old system. But the shippers and consignees insist that this theoretical advantage is not in fact realized, but that, owing to causes for which neither they nor the ship owners are responsible, the delays have not been largely diminished. It is a fact that since the introduction of the clause there has been a great and rapid increase in the trade of the port of London in articles produced on the other side of the Atlantic, which is pointed to as a proof of the benefit gained by produce importers from the change; but it is obvious that many other causes may have produced this increase without any such benefit accruing to the importers from that particular cause.

Whether the charge of 1s. 9d. now made on flour for the cost of handling it until actual delivery to the consignee's barge is a proper one does not, in my judgment, depend upon the actual cost of the labor so incurred being more or less than the charge so made. It depends upon an ulterior inquiry of much broader scope than any which I have power to make, namely, whether taking the freight and charges in the bill of lading together, the North Atlantic lines running to London, by their combined action by means of this London clause—which shippers and consignees can neither resist nor control—are exacting from them more than a reasonable profit for the carriage and delivery of their goods. The American shippers are clearly entitled to an investigation of this question by the competent authority of congress. If upon a full examination of all the facts this question should be answered in the affirmative, the wisdom of congress should be able to provide a remedy. The mere ascertainment and exposure, under the authority of congress, of such an unjust exaction, if it exists, would probably go far toward a cure of the evil. If this ulterior question should be decided in the negative, and it should be found that these great steamship lines are not using their united power to exact more from the shippers and consignees for the carriage and delivery of their goods than is fair and just, the only question that would remain for congress to determine is one of method, whether the convenience of commerce requires that by an amendment to the Harter law, or other suitable enactment, all ship owners should be forbidden to insert in the bill of lading any charge in addition to freight for the discharge and delivery of the goods. Of course, such an enactment would in all probability be immediately followed by an increase of the freight to London by the 1s. 9d. now charged for this item, or a greater amount. There are obvious advantages in the old rule that the freight named in the bill of lading should cover all charges for the carriage and delivery of the goods. The shippers and consignees have added to their protests against the extra charge the request, from time to time made to the ship owners, to include it in the freight, but this the steamship companies have steadily refused. They appeal to the long continuance of the present system of charging since 1888, and to their belief that such an amendment of the Harter act would be a serious blow to the trade with London, affecting not only the ship owners, but also the American shippers and London receivers.

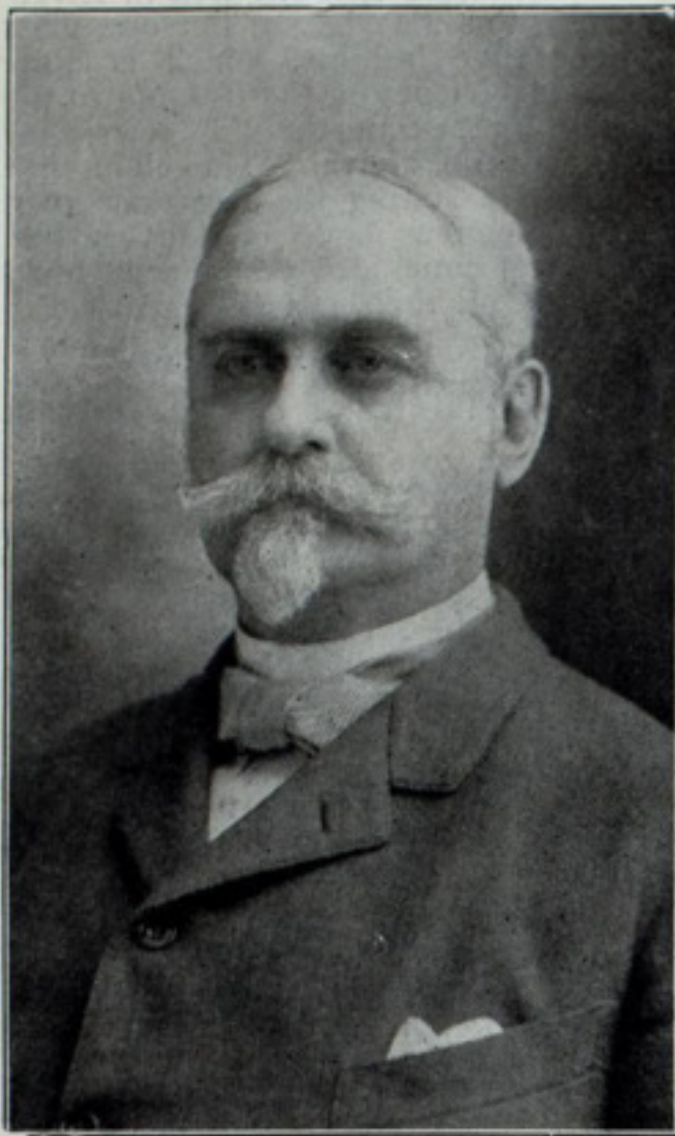
It might well be that in the event of its being found that the ship owners, by their combined action, are exacting from shippers and consignees by means of the London clause more than a fair and reasonable profit for the carriage and delivery of their goods, such an amendment of the Harter act would have a wholesome effect in restraining the combined companies from imposing an extravagant freight, made up of the total freight and charges, and thereby themselves inviting a competition which now seems impossible.

I have made this report chiefly on flour as affected by the "London clause," because the correspondence which accompanies the department instruction related solely to it. But there are other articles and other branches of trade similarly affected by it.



## COL. ROBERT ANDREWS.

At a meeting of the board of directors of the Safety Car Heating & Lighting Co., held at the offices of the company, No. 160 Broadway, a few days ago, Col. Robt. Andrews, heretofore the vice-president of the company, was elected to the presidency, vice Arthur W. Soper, deceased. The vacancy in the board of directors was filled by the election of Mr. A. C. Soper to serve on the board. Mr. A. C. Soper is a brother of the late Arthur W. Soper.



Col. Robert Andrews is well known in railroad circles and has a host of warm friends. He was born in Wilmington, Del. He attended school at the Episcopal Academy at Cheshire, Conn., from which he was graduated in 1849. After leaving the academy he entered Trinity College at Hartford, where he was graduated in 1853. He then took a course in the Polytechnic College at Philadelphia, graduating in 1854. His first position was that of assistant engineer of the state canals of Pennsylvania, in which capacity he served from 1854 to 1857, his next appointment being that of principal assistant engineer of the Sunbury & Erie railroad, and he served that company for three years from 1857 to 1860. From

1861 to 1864 he was staff officer in the army during the civil war. From 1864 to 1865 he was chief engineer of the Saratoga & Hudson River railroad and for the twenty years from 1865 to 1885 he served the Wabash railroad as division superintendent, chief engineer and general superintendent. From 1885 to 1888 he was general superintendent and engineer of the Virginia Midland railroad, and from 1889 to 1901 vice-president of the Safety Car Heating & Lighting Co. and the Pintsch Compressing Co. This brings his record up to the time of his election to the presidency of both the last named companies.

## END OF THE CASCO'S GLORY.

The following interesting description of a casco, which is about to be replaced by the modern lighter, is taken from the Manila Critic:

The casco is a craft for coast and river commerce, and is the home of its crew and patron, the former living fore and the latter aft. It is a boat-like structure, hooded with bamboo, and is the handiwork of the Filipino water rat. Its functions on water are the functions of the caraboa on land. It is slow and cumbersome and will soon be a fancy of the past, for lighters are to take its place. The casco has had a unique field for ages. Manila is not a city of great wharves, such as the traveler may see in Liverpool, New York and inland Chicago. Manila bay is not a deep-water harbor, hence, when great ships or transports anchor, means must be at hand to convey their people and cargoes into port, and the casco has been and is the chief "beast of burden" employed to do it. There are cascos and casquitos, both hooded and covered, and both are built on like principle. The former has a tonnage of 2 to 100 tons and the latter 8 to 20, so ability to carry gives the dignity of name. The casco is from 70 to 90 ft. in length, has a beam of 10 to 12 ft. and draws from 2½ to 3 ft. of water when loaded. It is built of light, tough wood grown in the province of Bataan, greatly resembles teak, and it will last for centuries on land or in water. The casquito, the child of the casco, is from 20 to 60 ft. in length and has a proportionate beam.

Cascos and casquitos are usually propelled by a bamboo pole 18 or 20 ft. in length, in the hands of husky Filipino river men. The poles are spiked and padded, so that the crew may place them against their shoulders and give force to their pushes as they move up or down stream and out and into the bay. Running boards of bamboo are attached to each side of the casco, touching the water, and upon these the crew prod their craft whither they will, aided, of course, by a rudder. The crew of a casco numbers from five to ten men, and their families live, as hitherto mentioned, fore and aft. The casco man is cradled in a casco and is the water rat of the Philippines. Food is cooked in earthen pots fed from the flames of fagots; plates are the leaves of the palm, fingers, forks, and teeth, knives. Rice, fish, oysters, clams and shrimps are the staff of life of the casco family. The bow and stern of the craft provide the home and its center the place for the cargo. The pay of the crew is one peso per day and that of the patron one peso media. Rentals run from 15 to 40 pesos per day. Less than a year ago full tonnage cascos brought 100 pesos per day, while under Spanish rule the maximum price was 13 pesos. The rental transitions of the casco have been quite marked, yet it furnishes the water-loving Filipino a cradle for his babies, a means of revenue and a place to die. When the hour for slumber comes the bow and stern are cleared, the floor is spread with palm mats and they all lie down in a heterogeneous mass, a dozen or more together, something like sardines in a box. The casco crew are certainly a primitive people, and they live in primitive style.

The casco made a number of Americans rich during the last three years—men who came to Manila as soldiers of fortune in '98 and early in '99—men who had not a dollar in the world above the necessity of living. They took the situation in, saw at a glance that means must be provided for unloading and landing cargoes and soldiery and the vast stores of everything necessary to sustain life during a period of war. The casco was seized upon, cornered at a very low wage, and in a trice rentals shot up like a meteor, and the government in its emergency had to pay the

price. There was nothing else to do. Soldiers and civilians had to be fed, arms and ammunition had to be supplied the men in the field, and, in consequence, the carpetbagger won a point, and the snake-like casco was his medium. The casco has long been the home of a class of the ladrone element—a retreat for thugs and thieves and robbers. It is to them what the great wharves of America and European ports are to the water rats and lawless element there, and it has always been regarded as a safe place to secrete plunder. The man of the Pasig could hide it forever in the event of a hot chase by officers of the law and no one knows how to do it so well as the criminal who lives his life on the river—a habitue of the casco, hitherto an important factor in local commerce, but soon to be replaced by modern lighters.

## AROUND THE GREAT LAKES.

Frankman Bros. & Morris, St. Paul, Minn., have been awarded the contract for rebuilding No. 4 ore dock at Two Harbors. The work will cost \$150,000.

Geo. Frietsche of Tonawanda, chief engineer of the steamer Chemung and one of the oldest engineers in the Union line, died a few days ago in Denver, where he had gone in search of health.

Seither Transit Co. is the name of the corporation that will own a large freight steamer which the American Ship Building Co. has under order from Frank Seither and others of Cleveland.

The Algoma Tube Works, Ltd., were incorporated this week with an authorized capital stock of \$30,000,000. This is the largest yet of the Clergue industrial enterprises. If the plant is built it will give work to several thousand men. The provisional directors are: F. H. Clergue, Sault Ste. Marie, Ont.; E. V. Douglas, W. H. Douglas, F. S. Lewis and John S. Freeman, Philadelphia; H. C. Hamilton, Sault Ste. Marie, Ont.

The Tunnel City Boiler Works of Port Huron has of late so arranged its equipment that ordinary hull repairs on steel vessels may be undertaken at its docks, in addition to all kinds of boiler work. With 500 ft. frontage on the St. Clair river and with works situated on the docks, piping for the operation of pneumatic tools may be readily extended to vessels requiring repairs. The works are equipped throughout with improved machinery.

Mr. Duncan Frazer, who was chief engineer of the Bessemer Steamship Co.'s vessels, and who has been employed with the Pittsburg Steamship Co. since the Bessemer fleet was taken over by the steel corporation, has accepted the position of chief engineer for the United States Transportation Co., of which W. W. Brown of Cleveland is manager. The steamer A. G. Brower, first of several large steel freighters which the American Ship Building Co. is building for the new United States company was launched at South Chicago Saturday.

The Marine Boiler Works of Toledo, O., is about to be organized with a capital stock of \$100,000. The plant of Richard Reeves & Co., which has been in operation for the past eleven years, will be used as the nucleus of the new concern, the Reeves company turning over its plant for its appraised value in stock. Four acres of land have been purchased adjoining Craig's ship yard and a contract is about to be let for the construction of a building 235 ft. long and 100 ft. wide. The equipment of the new plant will be complete in every particular.

The filing of articles of incorporation of the Michigan Steel Boat Co. has been followed promptly by the issuance of a permit to construct a boat manufactory at the southwest corner of Jefferson avenue and Bellevue, Detroit. About \$35,000 will be expended on buildings and machinery. It is the purpose to move the factory of the company from Kalamazoo to Detroit. Those interested in the company are: Hugo Scherer, Frederick E. Wadsworth, Frank D. Ross and Arundel B. Wigle of Detroit; Chandler G. Bullard, Arthur E. Chambers and Lewis H. Bullard of Kalamazoo.

It is said that at a general meeting of owners of lumber-carrying vessels, to be held in Detroit immediately following the meeting of the Lake Carriers' Association, an effort will be made to organize a company that will own outright fifty or more lumber vessels—enough to control carrying charges. If arrangements can be made for absolute control of about fifty vessels, freight matters will certainly be in the hands of the managers of such a fleet. Even the losses among lumber carriers from storms, accidents, etc., during the past season will cut quite a figure in freights, as vessels of this kind are not being replaced by new ones.

Mr. Eugene F. Brandt, Iron Mountain, Mich., has been appointed general superintendent of the mines and mining explorations of the Lake Superior Power Co. This embraces the Clergue syndicate's extensive mining interests in the Michipicoten district, the nickel mining properties at Sudbury, Ont., and the explorations on the Marquette and Menominee ranges. Capt. Arthur Buzzo, who has been in charge of Crerar, Clinch & Co.'s interests on the Crystal Falls range of Michigan for some time past, has resigned to take the superintendency of the Helen mine. Frank U. Nelson has also resigned from the superintendency of the Verona Mining Co. to become Capt. Buzzo's assistant.

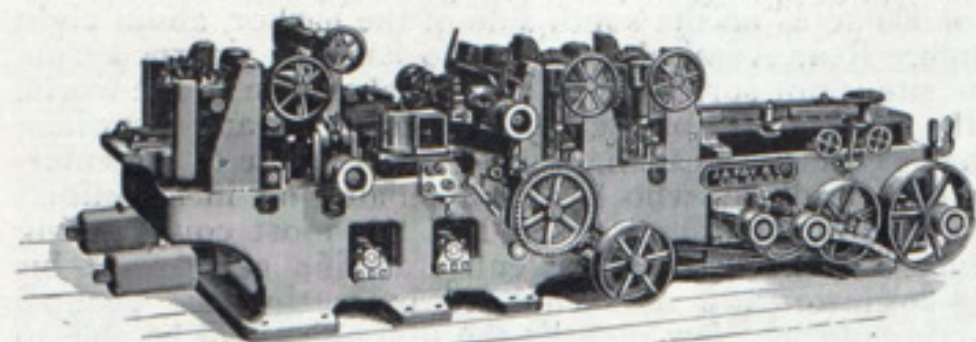
It is reported from the Mesabi range of Minnesota that a big find of iron ore in section 32-57-22 is to be opened up. The Eastern Minnesota road has put an engineering crew at work surveying a spur of the mine. It is estimated that about 30,000,000 tons of iron ore of various qualities has been shown up in the vicinity during the past few months. Small interests in the leasehold are said to have been sold in the past few days that indicate a value of \$1,000,000 for the entire property. Mines of Mesabi and Vermillion ranges employed during the past year from 8,000 to 9,000 men, according to the report of the state labor bureau. The wages now average \$2.42 per man for miners. In 1898 the total number employed was 4,400 and the average wages for miners \$1.80. The average wages for all mining work is now \$2.07; in 1898 it was \$1.60.

Japanese advices state that the Nippon Yusen Kaisha (Japan Mail Steamship Co.) has decided to build in Japanese ship yards sixteen steamers between now and 1907. These steamers will be used to augment the company's great fleet running to America, Australia, London and up and down the Asiatic coast. This increase is made to meet growing competition.



**A FLOORING MACHINE.**

There is illustrated herewith a machine just placed upon the market by the J. A. Fay & Egan Co., No. 325 to 345 West Front street, Cincinnati, O., and patented March 20, 1900. It is known as their No. 15 double-



cylinder lightning flooring machine. This machine, which will plane four sides, 9 to 14 in. wide and 6 in. thick, embodies in its construction many new devices and

conveniences not heretofore contained in a machine of this description. Among the more noticeable of the mechanical advantages claimed for it are:

1. The pressure bar before the first upper cylinder is adjustable both to and from the cut, and the bar after the cut is adjustable for difference in thickness of material; also the bars before and after the second upper cylinder.
2. The pressure bars both before and after the lower cylinder are adjustable vertically and laterally.
3. A pressure bar, with independent adjustment, extends over the matching works, and can be thrown out of the way quickly.
4. The patent weighted matcher-clip, which produces a uniform pressure on the material.

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5. The feed, consisting of six rolls, 8 in. in diameter, driven by a train of powerful gearing extending through the machine; and the expansion gears on feed rolls are inside the frame.

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**DEATH OF FRANK H. PEAVEY.**

Frank H. Peavey of Minneapolis, the largest cash handler of grain in the world and president of the Frank H. Peavey Grain Co., died very suddenly of pneumonia at the Auditorium annex in Chicago last Sunday afternoon. Two days before he had apparently been in robust health. His wife and daughter were present at his death. Mr. Peavey was fifty-two years old, and since he entered business, at the age of fifteen, he had prospered. His estate is supposed to be worth more than \$5,000,000, and he leaves life insurance policies of \$1,376,000 besides. A policy for \$1,000,000 is made payable to himself or his heirs, but its purpose was the furnishing of ready capital for the Peavey Grain Elevator Co. in case of his death. The Peavey company is the largest grain company in the world. It is an institution which Mr. Peavey built up and in which his sons-in-law are junior partners. The headquarters is in Minneapolis, and there are branches in New York, Chicago, Duluth, Kansas City and Portland. Mr. Peavey was also president of the following elevator companies: Interior, Republic and Peavey of Minneapolis; Duluth, Grove, Belt Line, Peavey and Duluth Terminal of Duluth; Midland of Kansas City; Omaha Elevator Co., and the Peavey Elevator Grain Co. of Chicago.

Mr. Peavey did not speculate, but he controlled more actual holdings of grain than any living man. The elevators and the grain company made him the most impressive figure in the grain field, and his influence reached into all the markets of the world. Outside of his tremendous business affairs, which included directorships in the Great Western and the Sault Ste. Marie railways and the Northwestern National Bank in Minneapolis, Mr. Peavey found time for charity and the cultivation of the social side of life. He was a member of the Union League and the Chicago clubs of Chicago, and was a member of two Minneapolis clubs. He gave freely to charitable enterprises and the Peavey fund in Minneapolis is well known. To encourage newsboys to save their money he offered to deposit to their credit \$1 for each \$1 that they put in the bank themselves.

Mr. Peavey was born in Eastport, Me., Jan. 18, 1850, and when he was fifteen began his business career in Chicago as a bookkeeper in the Northwestern National Bank. Two years later he went to Sioux City, Iowa, and began work for H. D. Booge & Co., wholesale grocers, pork packers, and makers of farming implements. Before he was five years older he was a member of the firm and the name had been changed to Booge, Smith & Peavey. In the farming implement line he laid the foundations for the mammoth grain business that he called into being after he had bought out the interests of his partners. One of the most marked of his business characteristics was his alertness. He was always looking for a chance to increase his business, and one indication of his progressiveness was his institution of the Peavey steamship line, which includes many lake steamers and which is a valuable auxiliary of the grain trade.

For navigation charts apply to the Marine Review.

**DELIGHTED WITH PEARL HARBOR.**

The naval authorities are elated over the acquisition of Pearl harbor naval station site, the jury in the condemnation proceedings instituted last year having fixed \$75 an acre as the price the government must pay for the Bishop estate of 600 acres on the south side of the harbor, about eight miles from Honolulu. Rear Admiral Evans, who has just returned from the Pacific, says the site is not surpassed by any naval station in the world. Its selection and the prosecution of the work in congress and elsewhere to give the navy the advantages Pearl harbor offers were due to the enterprise of Rear Admiral Bradford, who has been unfaltering in his efforts to utilize the splendid opportunities it offered as the most commanding and least vulnerable strategic base in the entire Pacific ocean. At his instance the army engineers are now engaged in cutting the channel through the coral reef, and in a few months the first ships will be able to enter the harbor. The purchase of the land has been accomplished only after a tedious process at law, the land having been assessed at \$10 an acre a few years ago, but last year its owners demanded \$300.

Admiral Bradford will now prepare estimates to be sent to congress asking authority to build a drydock and a few shops, and other bureaus of the navy will ask for appropriations. It is expected that the dock will be cut out of the coral formation at an inlet which seems to have been provided by nature for this purpose. The war department has already submitted to congress a project for the erection of batteries at the harbor entrance of a character to keep a hostile force at a safe distance.

Employees of the firm of George B. Carpenter & Co., 202-208 South Water street, Chicago, saw the New Year in in royal fashion. The sail loft, the scene of so much activity, had been cleared during the day, the workmen suspending operations at noon, and the evening was given over to enjoyment for everybody connected with the establishment. All of the 350 employes with their wives, sisters and other fellows' sisters, attended. Mr. and Mrs. George B. Carpenter and Mr. and Mrs. Benjamin Carpenter received. The loft was gaily decorated with flags and bunting and presented a most charming appearance. Luncheon was served as the New Year came in.

Excursion rates to Florida via Baltimore & Ohio R. R. and Washington, D. C., passing through the beautiful cities of the south. Stop over privilege allowed on all round trip tickets. Two fast trains leave Cleveland daily at 3:00 and 11:20 p. m. Call at city ticket office, 241 Superior street.

The American Bridge Co. has secured the contract for the steel superstructure of the Wabash railway's cantilever bridge over the Ohio river at Mingo junction. The amount of the contract is over \$600,000. The work is to be completed before Jan. 1, 1903.

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Number of Nautical Miles made each year by Steamships of the Messageries Maritimes Co., Provided with Belleville Generators—Since their Adoption in the Service.

Year.	Australien	Polynésien	Armand Béhic	Ville de la Ciotat	Ernest Simons	Chili	Cordillère	Laos	Indus	Tonkin	Annam	Atlantique
1890.....	67,728	2,460										
1891.....	68,247	68,331	204									
1892.....	68,247	68,403	69,822	23,259								
1893.....	68,379	68,343	68,286	68,247								
1894.....	68,439	68,367	68,574	68,439	37,701							
1895.....	68,673	68,766	68,739	68,808	40,887	28,713						
1896.....	69,534	92,718	69,696	69,549	62,205	63,153	40,716					
1897.....	68,250	69,606	92,736	69,555	62,235	76,110	63,357	43,146				
1898.....	70,938	69,534	69,552	69,597	62,526	63,240	63,240	62,553	63,954	22,707		
1899.....	69,534	69,615	67,431	90,405	60,246	62,778	62,868	52,344	54,855	44,007	22,884	
1900.....	69,534	67,494	69,744	69,564	61,719	62,382	62,502	51,471	53,373	62,016	63,066	52,140
Total.....	757,503	713,637	644,784	597,423	387,519	356,376	292,683	209,514	172,182	128,730	85,950	52,140

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